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Bibliography on Long Range Forecasting, p. 124

2 February, 1951 No. 2

METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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B. Bibliographic references to other items of interest to the profession.

C. Selective, annotated bibliographies on subjects of immediate and special interest to meteorologists.

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 2 FEBRUARY 1951 No. 2

SPECIAL FEATURE IN THIS ISSUE

A Selective Annotated Bibliography on Long Range Forecasting

(For complete table of contents see back cover)

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FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field and in related fields and to provide bibliographic information on various subjects, as interest demands.

Part I contains from 100 to 200 abstracts of current periodical literature and monographs in the fields of meteorology, hydrology, oceanography, etc. These abstracts are arranged according to the Universal Decimal Classification.

Part II of each issue comprises a special annotated bibliography of from 50 to 250 important references on a special subject without respect to recency of material. No attempt is made to prepare exhaustive bibliographies; instead, the aim is to include a representative cross section of the various aspects of a subject. Preference is given to recent material, comprehensive works, material from obscure sources, and items with good bibliographies.

Vol. 1, No. 1–11, Jan.–Nov. 1950 carried the following bibliographies: *Atmospheric Pollution, Aerobiology, Cloud Physics and "Rainmaking," Hail, Tornadoes, Volcanic Dust, Climatic Changes, Thunderstorms, Icing, Acoustical Propagation*, and *Evaporation.*

Forthcoming bibliographies will be:

1. **Extended Forecasting,** Vol. 2, No. 1, Jan. 1951.
2. **Long Range Forecasting,** Vol. 2, No. 2, Feb. 1951.
3. **Soil Temperatures,** Vol. 2, No. 3, Mar. 1951.
4. **Nomograms and Computation Tables,** Vol. 2, No. 4, April 1951.
5. **Climate of the Near East,** Vol. 2, No. 5, May 1951.

Other bibliographies in preparation for 1951 are: *Carbon Dioxide in the Atmosphere, Climate and Cancer, Climate of the Middle East, Machine Methods in Meteorology, Objective Forecasting, Radar and Radio Meteorology, Special Winds*, and *Turbulence.*

Part III contains a listing of the contents of those journals which are primarily meteorological. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. In the June and December issues cumulative indexes are published.

It would be madness, and inconsistancy, to suppose that things, which have never yet been performed, can be performed without employing some hitherto untried means.

FRANCIS BACON **NOVUM ORGANUM** I (vi)

INTRODUCTION

Progress in meteorology (especially in long range forecasting) has been so slow, and disappointments so great that a meteorologist or forecaster without a sense of humor would not long survive the contumely, let alone the self criticism which inevitably falls on anyone attempting the (almost) impossible. In fact, meteorologists usually appreciate and even collect the numerous cartoons or jokes ridiculing the weather forecaster, which have constantly appeared in the press of every country, whether controlled or free, for centuries.

The following parody, (which was hastily composed while on a train ride by Dr. C. E. P. Brooks after he had spent several weeks intensively going over reams of material on long range forecasting in many languages and covering many decades of fruitless effort and many "schools" of thought), is presented in the above mentioned spirit of cartoon or self-caricature. It is hoped that no one whose favorite theory is mentioned will take offense, as none is intended. On the other hand, the four chief lines of effort in long range forecast research during the past century are very clearly brought into perspective in the four main stanzas of this "poem," and the fact that the layman or rustic sometimes makes a better forecast than the professional statistician, astrophysicist or synoptic meteorologist is so well-known that if scientists had been completely discouraged by this fact, they would have given up attempts at forecasting the weather decades ago. But the failures of the past in any field of human endeavor have only served as an incentive to greater efforts in the future—especially as new methods become possible through technological or scientific advances in related or even in entirely unrelated field. The purpose of this bibliography, then, is to bring together knowledge of such advances whether directly or indirectly related to forecasting or meteorology.

HIAWATHA, FORECASTER

By: *C. E. P. Brooks*

When the handsome Paupukeewis
Planned to take a month's vacation,
He did ask of Hiawatha
If the skies would be propitious,
If the sunshine would be pleasant
And the winds be soft and gentle.

Hiawatha first bethought him
Of an ancient learned cyclist
Famous for his dire predictions
Of all human ills and ailments.
Learnedly the cyclist answered,
Spoke of planets in their courses,
Spoke of sunspots, spoke of Weickmann,
Spoke of waves of daily pressure,
After many calculations,
Counting backwards, counting forwards,
Brought to light a golden cycle;
Then he mounted on the cycle,
Pushed it forth into the future
And brought back a fearsome warning,
A month of hurricanes, tornadoes,
Avalanches, thunder, rainstorms,
All the ills of wind and weather.
But the forecast failed completely.

Hiawatha next consulted
With a distant co-relation
(Uncle's widow's brother's father)
Who was skilled at disentangling
Complicated interactions.
Many sheets the co-relation
Filled with abstruse calculations,
Then he smiled a smile of triumph,
Spoke to Hiawatha thuswise:—
From the pressure at Hawaii,
Darwin, Santiago, Moscow,
From the floods in Nile-fed Egypt
And the winters in Spitsbergen,
I deduce with great assurance
That the next month will be stormy,
Heavy rainstorms, freezing blizzards,
Quite unfit, in my opinion
For an open-air vacation.
But the forecast failed completely.

Hiawatha next consulted
Patient watchers of the heavens
In a mountain monastery,
Who informed him of their knowledge
That the solar radiation
Had decreased in all its wave-lengths
By one part in seven million.
This the prior told him gravely
Meant disastrous repercussions,
For the storm-tracks would come southwards
Till a permanent depression
Displaced the usual anticyclone
And the weather of the next month
Would be really most unpleasant.
But the forecast failed completely.

Then the handsome Paupukeewis,
Wearied of the sages' counsel,
Sought an ancient whiskered farmer,
Asked him of the coming season,
And the farmer spoke him fairly.
Sir, the turrible rheumaticks
In my joints which come from dampness,
Praise the Lord, are all departed
And I can assure your Honour
That the prospects are auspicious,
Little rain and plenty sunshine,
Gentle winds and kindly weather.
So the handsome Paupukeewis
Thanked him for his words of wisdom,
Hastened forth on his vacation
And enjoyed himself immensely,
For the forecast proved successful.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

Library symbols used in this issue may be found in the following list:

DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DNO:	U. S. Naval Observatory Library, Washington, D. C.
DSI:	Smithsonian Institution Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain Meteorological Office Library, Harrow, England.
MH-BH:	Harvard University, Blue Hill Observatory (and American Meteorological Society) Library, Milton, Mass.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
§	before an entry indicates a synoptic case history study accompanied by charts.

Geographic locations are in the English form rather than the form used locally, for example, Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

Meteorologische Rundschau, 2(5–6):146–151, May–June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (Vol. 2), *Heft* 5–6 (No. 5 and 6), *pages* 146–151, May–June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

GENERAL METEOROLOGY

2.2–1 551.5

Baur, F., **Bemerkungen zu H. Flohn's Besprechung der "Einführung in die Grosswetterkunde."** [Remarks on H. Flohn's review of "Introduction to large scale weather science."] *Meteorologische Rundschau*, 3(7–8):174–175, July–Aug. **1950. DWB**—Answers criticisms by FLOHN, *ibid.*, 2:248, 1949. *Subject Heading:* **General meteorology.**—*C.E.P.B.*

2.2–2 551.5:358

Editorial. *Marine Observer*, 20(150):187–190, Oct. **1950.** 3 figs. **MH-BH**—Brief account of effect of weather in evacuation from Dunkirk, May 26–June 2, 1940. *Subject Headings:* **Applied meteorology, Military operations.**

2.2–3 551.5:06(09)

Keil, Karl, **Ein Brief Alexander von Humboldts an den Geh. Sanitätsrat Dr. Med. Friedrich W. Stohlmann in Gütersloh.** [A letter from Alexander von Humboldt to Privy Medical Councillor Dr. F. W. Stohlmann at Gütersloh.] *Meteorologische Rundschau*, 3(9–10):221–222, Sept.–Oct. **1950. DWB, MH-BH**—A letter dated July 30, 1846, setting out a plan for a Prussian meteorological institute. *Subject Headings:* **Meteorological organizations, History, Prussia.**—*C.E.P.B.*

2.2–4 551.5:551.46(02)

†§Donn, William L., **Meteorology with marine applications.** 1st ed. New York, McGraw-Hill, **1946.** 465 p. numerous figs., tables and refs., 2 append. "Correlated list of visual aids": p. 453–456. **DLC**—A modern textbook with emphasis on the synoptic approach and with special attention paid to aspects which affect the observation and transmission of weather at sea, the preparation of synoptic charts and interpretation of weather conditions for marine navigation. A large section is devoted to the oceans, with a discussion of sea-ice, waves, ocean currents, and the climate of the ocean areas as well as many phases of physical oceanography outside the field of meteorology. Tables of climatic data for various parts of the earth are appended. *Subject Headings:* **Marine meteorology, Oceanography, Textbooks.**—*M.R.*

2.2–5 551.5:523.4

†Kuiper, Gerard P., **Survey of planetary atmospheres.** (In **Atmospheres of the earth and planets,** Gerard P. Kuiper (ed.). Chicago, University of Chicago Press, [1949]. p. 304–345. 20 figs., 7 tables, 35 refs., 5 equations.) **DLC**—Planetary atmospheres are considered on the basis of physical data, especially the use of the velocity escape and of temperature for predicting the stability of atmospheres of assumed composition determined by planetary spectra and by optical phenomena. Physical data comprise the following topics: limitations on the pressure of planetary atmospheres imposed by the kinetic theory of gases and limitations imposed by the physics and chemistry of the atmospheres (initial abundance of constituent atoms for each molecular compound; vapor pressures at existing planetary temperatures; the chemical and photochemical processes changing the "natural" abundance of a compound). Three groups of spectra are analyzed, namely: ultraviolet spectra (3000–4000 Å), medium or low dimensional spectra (0.4 to 1.0μ) and infrared spectra (1.0 to 2.5μ) with the PbS cell. The optical phenomena comprise the following: the haze on the atmosphere of Mars, the atmospheric transparency and daily temperature cycle of Mars, the eclipses of Jupiter's satellites, and the infrared polarization of Venus. *Subject Heading:* **Planetary atmospheres.**—*I.L.D.*

2.2–6 551.5:629.13(02

†§Gentile, Rodolfo, **Meteorologia per i piloti.** [Meteorology for pilots.] 2nd ed. Rom Ufficio Editoriale Aeronautico, **1942.** 284 p. 137 figs., 3 fold. synoptic charts, tables, 31 refs equations. **DLC**—A well-illustrated and edited text on aviation meteorology based mainly o Italian experience in flying and in meteorological service for aviation. Considerable space devoted to forecasting according to modern methods, especially of forecasting condition hazardous for airplanes and to a discussion of the various forecast services in Italy during th war. *Subject Headings:* **Aeronautical meteorology, Textbooks.**—*M.R.*

2.2–7 551.5:631.5

Sreenivasan, P. S., **Studies in sampling technique: efficiency of sample shapes for paddy** *Indian Journal of Meteorology and Geophysics*, 1(4):286–290, Oct. **1950.** fig., 3 tables, 7 refs **DWB**—Tests were made between 1934 and 1940 to determine the best shape of rice padd for statistical sampling. As a result, some modifications were suggested and these were trie in 1942 at Karjat and the results analyzed by means of (a) analysis of variance and (b) intra class correlation. Definitely proven that best shape is a figure 8. Other information provided *Subject Headings:* **Statistical methods, Agronomy.**—*M.R.*

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

2.2–8 551.501(02

†Provisional guide to international meteorological instrument and observing practice *Organisation Météorologique Internationale, Publication* No. 78. Lausanne, **1950.** 103+ p (loose leaf). Chaps. 1 to 10. tables, refs. (append. 1), equations. Price Sw. Frs. 8. **DWB MH-BH**—A systematically arranged guide (in English) prepared by a permanent sub-commission of the I.M.O. Commission on Instruments and Methods of Observation (C.I.M.O.) under the supervision of F. J. Scrase (London) and with the collaboration of members from Washington, Oslo, Paris, New Delhi, Cairo and Nairobi. The first ten chapters deal with observations of clouds and weather, pressure, temperature, humidity, wind, precipitation, evaporation, visibility, radiation and sunshine, and marine observations, in addition to general instructions for stations and networks, their establishment and maintenance. The guide contains a wealth of standard information on instruments, records, conversion tables, units, constants, corrections, etc. and on training of observers and inspecting stations. Later chapters will comprise similar information on aerological observations (pilot and sounding balloon, radiosonde and airplane observations). Naturally such a guide prepared in the brief time since C.I.M.O. met in Toronto (1947) will need revision from time to time. The loose leaf form facilitates such revision. *Subject Headings:* **Instruction for observers, Manuals.**—*M.R.*

2.2–9 551.501:55

The Base Directorate for Geophysical Research of the Air Force Cambridge Research Laboratories. *American Meteorological Society, Bulletin*, 31(6):205, 221, June **1950. MH-BH** —Brief account of work of organization as a whole, and of specific units such as the Atmospheric Physics Laboratory, Atmospheric Analysis Laboratory, The Upper Air Laboratory, The Terrestrial Sciences Laboratory, The Electromagnetic Propagation Laboratory and other activities. *Subject Headings:* **Geophysical research, Air Force Cambridge Research Laboratories.**—*M.R.*

2.2–10 551.501:551.510.535

Gallet, R., **Une nouvelle station ionosphérique à Dakar.** [A new ionospheric station at Dakar.] *Annales de Géophysique*, 5(3):248–249, July–Sept. **1949.** 3 refs., equation. **MH-BH** —The author discusses the value of this station for studying the following ionospheric phenomena: the effect of longitude upon the ionization of the F2 layer, the characteristics of the sporadic E layer at equatorial latitudes, precise measurement of the critical frequency of the normal E layer, absorption in the D layer and "fade out." The geographic and geomagnetic

ordinates of the station are given. *Subject Headings:* **Ionospheric stations, Dakar, North frica.**—*I.L.D.*

2.2–11 551.501.1(26)(02)

Great Britain. Meteorological Office, **Manual of meteorological observing. Part II. Marine Observer's Handbook.** 7th ed. London, H. M. Stationery Office, **1950.** 122 p. 32 gs., 22 cloud photos, 18 tables. At head of title: M.O. 522b. **MH-BH**—The standard book f instructions in British practice. Pt. I. Instrumental observations. Pt. II. Non-instrumental bservations (including estimation of cloud height, ocean waves, currents and ice). Pt. III. henomena, meteorological, miscellaneous (including aurora, magnetic storms, radio phe- omena), astronomical. Pt. IV. Meteorological work at sea, includes organization of voluntary hips' reports and International Convention for the Safety of Life at Sea 1948. The tables nclude correction and reduction of barometers and conversion of units, diurnal variations of ressure, humidity tables and conversion of apparent wind force and direction to true. This s the first part of the new series of "Manuals" planned by the Meteorological Office to reach ublication. *Subject Headings:* **Instruction for observers, Marine data, Manuals.**

2.2–12 551.501.9(43)

Wetterdienst im Spiegel der Wirtschaft. [Weather service for the national economy]. *Germany, Deutscher Wetterdienst in der US-Zone, Mitteilungen*, No. 2, **1948.** 46+ p. map, tables. **MH-BH**—An attractive bulletin describing the organization of the Deutscher Wetterdienst (US-Zone) and the various activities which can benefit by its services. Specifically the farmer, forester, engineer, physician, city planner, shipper, aviator, insurance company, etc. can profit by knowledge of the various phases of forecasting and the climatological services. *Subject Headings:* **Meteorological services, Germany.**—*M.R.*

OBSERVATIONAL DATA

2.2–13 551.506.5 526.91:629.13

Ronne, Finn, **Antarctic mapping and aerial photography.** *Scientific Monthly*, 71(5):287–293, Nov. **1950.** 9 photos, map. **DLC**—Photograph shows Cape Keeler Weather Station. Beautiful chart shows routes of air and land expeditions and region charted for first time by the Ronne Expedition. *Subject Headings:* **Antarctic expeditions, Aerial surveys.**

2.2–14 551.506.8:551.501.6

Baumgartner, A., **Methodisches zur Darstellung des Witterungseinflusses auf den Verlauf der Pflanzenentwicklung; erläutert an den phänologischen Beobachtungen 1947 in Bad Kissingen.** [On a method of demonstrating the influence of weather on the course of plant development; illustrated by the 1947 phenological observations in Bad Kissingen.] *Meteorologische Rundschau*, 3(9–10):217–221, Sept.–Oct. **1950.** 4 figs., 9 refs. **DWB, MH-BH**—The effect of weather on plant development each year is shown by plotting the departures of various growth stages from their long-period normals against corresponding departures of accumulated temperature ("phenogram"). This separates short-period from persistent weather phenomena. An example is shown and the component effects analyzed. Plant development is not steady but proceeds in bursts, following the totality of weather phenomena with a variable lag. *Subject Headings:* **Phenograms, Phenology, Bad Kissingen, Germany.**—*C.E.P.B.*

2.2–15 551.506.8

Ergebnisse phänologischer Beobachtungen im Deutschen Reich im Jahre 1936. [Results of phenological observations in Germany in 1936.] *Germany, Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 4(4), **1938.** 62+ p. 8 fold. charts, tables. **DLC**—This article contains detailed phenological observations on wild plants, cultivated plants (namely: wheat, rye, maize, oats, potatoes, rape, flax, beets, clover), fruit and vine and observations on the appearance of weeds, diseases and harmful insects. The phenological data have been plotted on maps and isolines have been drawn. The observations cover all of Germany and the data are given by provinces. *Subject Headings:* **Phenology, Agricultural meteorology, Germany.**—*I.L.D.*

2.2–16 551.506

*Kessler, Otto, **Zur Phänologie des Rheinlandes; Karten der Jahre 1934 und 1935.** [Ph
nology of the Rhineland; maps for the years 1934 and 1935.] *Germany, Reichsamt für Wette
dienst, Wissenschaftliche Abhandlungen*, 4(3), **1938.** 13+p. 24 fold. charts, 3 tables, 6 re
DLC—This article contains mean monthly weather data for the first six months of 1934 a
1935 for Western Germany and a general description of the weather during that period. T
phenological characteristics of various fruits, and grain crops during 1934 and 1935 are discusse
There are twenty-four maps illustrating the phenological calendar, average date of appearan
of first frost and average frost fall period, vine cultivation area, topography and forest are
Subject Headings: **Phenology, Agricultural meteorology, Rhineland.**—*I.L.D.*

2.2–17 551.506

Whillis, Joyce, **Mr. Pepys' weather.** *Weather*, 5(3):96–99, March **1950.** ref. **DWI
MH-BH**—Some typical excerpts from the diary given. *Subject Heading:* **Observational dat**

INSTRUMENTS

2.2–18 551.507.321.

Prudhomme, André, **Les vitesses ascensionnelles des ballons de radiosondage.** [Th
rate of ascent of radiosonde balloons.] *Annales de Géophysique*, 5(3):225–232, July–Sep
1949. 2 figs., 28 refs., equations. **MH-BH**—This is a study of the relationship between th
vertical gradient of atmospheric temperature and the rate of ascent of radiosonde balloon
The method for calculating the mean rate of ascent and determining variations from it
described. Correlation coefficients calculated between vertical temperature and rates o
ascent indicate that variations in rates of ascent are not caused by large scale vertical ai
movements but by the effect of air temperature upon the specific resistance of the balloon
The nature of the temperature gradient associated with intense variations of rates of ascen
is described. The rate of ascent varies when the Reynolds number is between 2×10^5 an
5×10^5 C.S.S. Variations in the rates of ascent of balloons by night and day are compared
Subject Headings: **Sounding balloons, Turbulence.**—*I.L.D.*

2.2–19 551.507.321.

Constant height balloons. *Weather*, 5(10):356, Oct. **1950.** 2 photos. **DWB**—Balloon
designed to keep cosmic ray apparatus for several hours at 65,000 ft. or higher. *Subjec
Heading:* **Constant level balloons.**

2.2–20 551.507.321.

Smith, R., **The release of radiosonde balloons.** *Weather Development and Researc
Bulletin*, No. 15: 51–55, June **1950.** fig. **MH-BH**—The author describes a method fo
releasing successfully radiosonde balloons during high winds. *Subject Heading:* **Sounding
balloons.**—*I.L.D.*

2.2–21 551.507.362(09

Siry, Joseph W., **The early history of rocket research.** *Scientific Monthly*, 71(5):326–332,
Nov. **1950.** 3 figs., 8 refs. **DLC**—An account of research in the development of rockets since
326 B.C.; including the first use of powder rockets (A.D. 1232 in China), the Congreve display
rockets (1801–1814) and the more elaborate rockets at the end of the 19th Century. No
particular reference to meteorological applications. *Subject Headings:* **Rocket research,
History.**—*M.R.*

2.2–22 551.508

Venkiteshwaran, S. P., **Progress in the design and manufacture of meteorological in-
struments in the India Meteorological Department workshop at Poona.** *Indian Journal of
Meteorology and Geophysics*, 1(3):180–183, July **1950.** 3 figs. **MH-BH**—Among the meteoro-
logical instruments which are being manufactured in India, the following are mentioned and
briefly described: cup anemometer and wind vane designed by J. M. Sil, an electronic distant

dicating wind instrument, a snow-rain gage, Kew pattern barometers, whirling psychrometers, marine bucket, hair hygrograph, wet and dry bulb thermograph, self-recording rain gage, rograph, the Dines anemograph, charts for recording instruments, a tilting bucket rain gage d the fan type radiosonde. Also various seismological instruments such as the Wood-nderson seismograph are being manufactured in India. *Subject Heading:* **Meteorological struments.**—*I.L.D.*

2.2–23 551.508.51:551.508.53

Kesavamurthy, A. and Venkiteshwaran, S. P., **A distant reading electronic anemometer d a selsyn operated windvane.** *Indian Journal of Meteorology and Geophysics*, 1(3):199–206, ly **1950.** 4 figs., 2 refs. **MH-BH**—A detailed description of the equipment is presented. block diagram, a circuit diagram and photograph of the electronic anemometer are given. the electronic wind speed indicator a radio frequency voltage of 30 kilocycles per second is nerated in an oscillator in the observer's room and is transmitted to a coil attached to the indle of a 4-cup anemometer. In a similar coil fixed below the first coil voltage is induced by utual inductance. A brass circular vane, with ten sectors attached to anemometer spindle d rotating between the coil, causes the induced voltage to fluctuate at a frequency which is oportional to the rate of rotation of the anomemeter cups. The induced voltage is amplified, nverted into square wave pulses, fed into a frequency discrimination circuit which indicates e frequency of voltage variations by an ammeter calibrated in miles per hour. In order to dicate the wind direction, the motion of the vane is communicated to a pointer in the ob-rver's room by means of a synchro-mechanism. *Subject Headings:* **Anemometers, Wind nes.**—*I.L.D.*

2.2–24 551.508.54

Harrison, J. H., **Meteorological instruments. Wind velocity recorder.** *Weather*, 11):374, Nov. **1950.** plate. **DWB**—Describes a standard cup anemometer modified so at trace records every 0.1 mile of wind by a down kick and every mile by an up kick. One eek's record on a single chart. *Subject Headings:* **Anemometers, Recording equipment.**

2.2–25 551.508.59:551.55

*Frankenberger, E. and Rudloff, W., **Windmessungen an den Quickborner Funkmasten 947–1948.** [Wind measurements on the radio tower in Quickborn 1947–1948.] Meteoro-gisches Amt für Nordwestdeutschland, Hamburg, **1949.** 47 p. figs., 42 tables. **MH-BH**—he vertical wind distribution at Quickborn at 10 m., 30 m. and 70 m. height is discussed and equency data for these levels for each day and month from March 1947 through Feb. 1948 ven in tables. These measurements made on a radio tower (near Hamburg) are described id compared with longer records made elsewhere. Finally, an analysis of wind variations ith season and height over all of Northwest Germany is made, both in tabular form and on a art. *Subject Headings:* **Wind measurements, Northwest Germany.**—*M.R.*

2.2–26 551.508.821

Harrison, J. H., **Meteorological instruments—long period recorders.** *Weather*, 5(10):357, ct. **1950.** 3 photos. **DWB**—A weekly recording hygrothermograph modified to record for 8 days by substituting for the direct clock drive a 1–4 pulley drive operated by a falling weight. lodified pen also described. *Subject Headings:* **Recording equipment, Hygrothermographs.**

2.2–27 551.508.96

Schrott, R., **Ein Echolotungsgerät für Ionosphären- und Wetterforschung.** [An echo-unding apparatus for ionosphere and weather investigation.] *Archiv für Meteorologie, eophysik und Bioklimatologie, Ser. A*, 3(1–2):109–112, **1950.** 3 figs., 3 refs. German, nglish and French summaries p. 109. **DWB**—An impulse transmitter and receiver is escribed combining low cost, high accuracy and safe working. Wiring diagrams given. It an be used for measuring critical frequencies and the altitude of the ionosphere. *Subject leadings:* **Echo sounding apparatus, Electricity measurement instruments.**—*C.E.P.B.*

SYNOPTIC ANALYSIS AND FORECASTING

2.2–28 551.509

Schmauss, August, **Das Problem der Wettervorhersage.** [The problem of weather forecasting.] 5th ed. Leipzig, Becker & Erler, **1945.** 138 p. numerous tables, 134 refs. (*Probleme der kosmischen Physik*, Vol. 1) **DLC**—This book is not an introduction to synoptic meteorology. It is a comprehensive survey of the practical, scientific and philosophic aspects of accurate weather forecasting. Nonscientific weather forecasting is discussed under the following topics: animals as weather prophets, weather sense of men, cosmic explanations of weather, lunar influence and popular weather maxims. The author then analyzes the phenomena of weather and climate, the atmospheric factors producing them, the assumptions underlying scientific weather forecasting, the techniques employed, the possibility of obtaining accurate forecasts, reasons for erroneous forecasts and the application of statistics to forecasting. Also, the various methods for making long range forecasts and their reliability are discussed. The hypothetical and probable element and the inherent objective uncertainty in forecasting are stressed. *Subject Headings:* **Weather forecasting, Long range forecasting, Weather lore.**—*I.L.D.*

2.2–29 551.509.1(02)

*Hamburg. Deutsches Hydrographisches Institut, **Wetterberichte und Sturmwarnungen.** [Weather reports and gale-warnings.] (In **Nautischer Funkdienst 1948.** Hamburg, Krögers Buch- und Verlagsdruckerei, **1948.** p. 59–83. chart, codes, symbols, 2 tables) **DLC**—Lists all broadcasts of weather reports and forecasts (including storm warnings) from radio stations in Germany, Poland, Baltic States, Sweden, Denmark, Netherlands, Great Britain, Ireland, Norway, Spitsbergen, Iceland, Greenland, France, and weather ships in the Eastern Atlantic. *Subject Headings.* **Hydrography, Weather broadcasting, Manuals.**—*M.R.*

2.2–30 551.509.1:551.509:621.396

Airmet petition. *Weather*, 5(12):403-405, Dec. **1950. DWB**—Interesting account of uses to which broadcast weather information is put—agriculture 27%, sport 21, aviation 21, head the list but the industrial uses are also important. *Subject Heading:* **Weather broadcasting.**

2.2–31 551.509.1:656.6

Weather messages for shipping. Fascicule IV. 2 Vols., Pts. A to F. (In **Synoptic weather messages,** *Organisation Météorologique Internationale, Publication* No. 9. Lausanne, **1950** ed. 2 Vol. (loose-leaf). codes, charts, tables, glossary.) **DWB, MH-BH**—The 1950 edition of Publ. 9, Fasc. IV is published in attractively bound, loose-leaf form. The first volume consists of Pt. A—Weather Broadcast Schedules for every region (continent) and for every broadcast point, including lists of stations, times of broadcast, forecast areas affected, etc. The second volume comprises Pts. B (Ship-shore transmission), C (International regulations for ship weather messages), D (List of meteorological liaison officers in ports of the world), E (Glossary of meterorological terms in English, French, Spanish and Russian), and Pt. F (Miscellaneous tables, codes and constants). *Subject Headings:* **Weather broadcasting, Meteorological codes, Glossaries, Marine meteorology.**—*M.R.*

2.2–32 551.509.21(26)

§Robinson, J., **Ship reports and the forecaster.** *Marine Observer*, 20(150):202–211, Oct. **1950.** 9 figs. **MH-BH**—A series of weather charts for North Atlantic, Feb. 4–5 and July 11–13, 1950, show the fundamental importance of ships' observations. *Subject Headings:* **Synoptic charts, Marine data.**

2.2–33 551.509.3:551.575:629.13

§*George, J. J., **The causes and forecasting of low ceilings and fogs at Jacksonville Airport.** Atlanta, Eastern Air Lines, Inc., Meteorological Dept., **1939.** 79 leaves. 47 figs., 7 tables, 10 refs., append. (Mimeographed) **DWB**—One of the first classic studies by J. J. George on the forecasting of fog at airports, based on a statistical-climatological or synoptic-climato-

ogical study of air masses, trajectories, types of fog and ambient humidity and wind conditions connected with fog formation at Jacksonville. Topographic features are discussed and a comparison made between conditions at Atlanta and Jacksonville. Many typical weather charts are presented for pre-warm front, advection and radiation fogs during the various seasons. Based on hourly observations for 1934–1938. *Subject Headings:* **Fog forecasting, Objective forecasting, Airways forecasting, Jacksonville, Florida.**—*M.R.*

2.2–34 551.509.3:551.575

George, J. J., **Jacksonville weather forecasting.** Atlanta, Eastern Air Lines, Inc., Meteorological Dept., Dec. 1, **1948.** 13 leaves. 8 figs., 5 tables, 2 refs. (Mimeographed) **DWB**—An extension and refinement of rules for forecasting fog and low ceiling at Jacksonville, first promulgated in J. J. GEORGE's paper (1939) (*see item* 2.2–33), to cover specifically the numerous cases of advection fog. A catalogue of cases occuring during the intervening years is included and charts for objective forecasting based on classification and analysis of these cases, are presented. *Subject Headings:* **Fog forecasting, Objective forecasting, Jacksonville, Florida.**—*M.R.*

2.2–35 551.509.3:551.577

Williams, Philip, Jr., **An objective method of forecasting summer precipitation at Salt Lake City, Utah.** *Monthly Weather Review,* 78(8):148–152, Aug. **1950.** 2 figs., 4 tables, 8 refs. **DWB**—Data for July and August 1946 through 1949 were used to test the significance of numerous variables against probability of precipitation at Salt Lake City. A scatter diagram was prepared showing relation of the latter to surface dew point at Salt Lake City (0530 MST); temperature—dew point spread at 2030 MST between 700 and 500 mb. at Las Vegas, Ely, Grand Junction, Boise or Lander (depending on 12,000 ft. air flow). Independent check shows skill score slightly below that of staff making subjective forecasts. *Subject Headings:* **Precipitation forecasting, Objective forecasting, Salt Lake City, Utah.**—*M.R.*

2.2–36 551.509.317:551.515.4(54)

Banerji, S., **Forecasting of thunderstorms at Nagpur by slice method.** *Indian Journal of Meteorology and Geophysics,* 1(3):184–198, July **1950.** 4 figs., table, 3 refs., 9 equations. **MH-BH**—The author presents the principles of the slice method of the analysis of the tephigram to the forecasting of thunderstorms and the procedure adopted for determining the circulation acceleration for wet, dry and intermediate convective condensation levels. The application of the slice method to determine circulation acceleration and mean convective condensation layer at Nagpur is illustrated. A comparison is made between the inferences regarding the occurrence of thunderstorms by the slice and panel methods of tephigram analysis with the actual weather realized. It is concluded that for forecasting heat thunderstorms at inland stations the slice method of tephigram analysis is more reliable than the parcel method. The specific advantages of the former are discussed. *Subject Headings:* **Thunderstorm forecasting, Nagpur, India.**—*I.L.D.*

2.2–37 551.509.317

§Oliver, Vincent J. and Oliver, Mildred B., **Forecasting the weather with the aid of upper air data.** Chicago University, Institute of Meteorology, May **1944.** 59 p. 23 figs., 10 refs., equation. **DLC**—The authors present the principles, methods and rules for forecasting weather in middle latitudes from data on direction and change of direction of winds at 10,000 feet. The following aspects of forecasting from upper air data are discussed: frontal weather from motion of winds aloft relative to frontal positions, motion of surface systems and the weather associated with them from the direction of upper air flow, displacement of surface systems by means of pressure changes aloft, the deepening and filling in of waves by use of the 10,000 foot chart; forecasting with the aid of mean temperatures and mean temperature changes. Various general methods for forecasting the 10,000 foot chart and a method for constructing mean isothermics between sea level and 10,000 foot level are given. Synoptical examples illustrating the application of the rules are presented. The construction of isentropic charts, their use in forecasting of weather and their limitations are discussed. *Subject Headings:* **Weather forecasting, Synoptic analysis, Isentropic analysis.**—*I.L.D.*

2.2–38 551.509.33:551.524.33

Abbot, Charles Greeley, **A prediction of Washington temperature 1948. (Made January 1948.)** *Smithsonian Miscellaneous Collections*, 111(6), March 8, **1949.** 6 p. fig., 2 tables. **MH-BH**—In Jan. 1948 author predicted 55 dates of min. temperature at Washington in 1948, based on a periodicity of 6.6456 days. These are largely verified and a similar prediction made for 1949. *Subject Headings:* **Long range forecasting, Temperature forecasting, Washington, D. C.**—*C.E.P.B.*

2.2–39 551.509.33

Schindler, Gerhard, **Ist eine Wintervorhersage möglich?** [Is it possible to predict the winter?] *Kosmos*, Stuttgart, 46(11):500–502, Nov. **1950.** 4 figs. **MH-BH**—The author discusses the general problem of long range forecasting of winter weather in Central Europe, describes in detail a method of long range forecasting of winter weather used by F. Baur and gives several examples of its application. This method is based upon significant, well derived relationships between the general weather situation of a severe winter and preceding anomalies of the atmospheric circulation, such as amount of precipitation during October and sunspot cycles. *Subject Headings:* **Long range forecasting, Central Europe.**—*I.L.D.*

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

STRUCTURE OF THE ATMOSPHERE

2.2–40 551.510.4 551.541:551.586:551.588.7

Courvoisier, P., **Über das Eindringen von Schwankungen der meteorologischen Elemente in Gebäude. Zur Theorie der Wetterfühligkeit.** [On the penetration of variations of the meteorological elements into buildings. On the theory of weather sensitivity.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 2(3):161–173, **1950.** 2 figs., 7 refs., 21 equations. German, English, and French summaries p. 161–162. **DWB**—Since sensitiveness to weather occurs inside buildings as well as outside, it must be due to some factor which can penetrate buildings without appreciable loss. Calculations were made to determine penetration of variations of pressure and of atmospheric admixtures (e.g. pollution) into an ordinary room. It was found that pressure variations of more than 1 cycle/sec. are transmitted unchanged without lag. Variations of composition are greatly weakened if the cycle is less than 1–2 hours (wind speed 7 m./sec.) or a day or more (wind 2m./sec. or less), and there is a lag of up to ½ period. In examining the effect of chemical changes (e.g. ozone) the observations must all be made in the same room. *Subject Headings:* **Atmospheric composition, Microvariations, Bioclimatology.**—*C.E.P.B.*

2.2–41 551.510.4 551.593.54:551.521.12

Hoelper, Otto, **Atmosphärische Trübungs- und Wasserdampfbestimmungen nach Filtermessungen der Sonnenstrahlung.** [Determination of atmospheric turbidity and water vapor content by measurement of filtered sunlight.] *Germany, Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 5(10), **1938.** 49 p. 8 figs., 9 tables, 20 refs., 2 equations. **DLC**—A critical discussion of the determination of atmospheric turbidity and water vapor content from measurement of solar radiation by the β-coefficient method and of the assumption underlying the use of the turbidity coefficients and those of Ångström-Hoelper are discussed and tables for their mutual conversion are given. Regular systematic deviations between turbidity measurements from total and filtered radiation are explained. A relationship is established between quantity of atmospheric water vapor and absorption of radiation as revealed by spectrographic data, and a method is developed for determining amount of water vapor from radiation measurements. Amounts of water vapor calculated by radiation measurements agree with those determined by aerosonde; deviations are corrected by comparison of turbidity coefficients for different wave lengths. From the improved values for water vapor, turbidity coefficients are calculated and agreement with theoretical values is demonstrated. *Subject Headings:* **Atmospheric structure, Turbidity measurement, Water vapor measurement, Solar radiation.**—*I.L.D.*

2.2–42 551.510.41:546.212

Vassy, Arlette and Vassy, Mme Étienne, **Recherches sur l'épaisseur d'eau condensable de l'atmosphère.** [Research on the depth of precipitable water in the atmosphere.] *Journal Scientifique de la Météorologie*, 2(7):65–74, July–Sept. **1950.** 6 figs., 9 refs. French, English and Spanish summaries p. 65–66. **MH-BH**—An instrument was devised (1940) by the author which would easily determine the amount of precipitable water in the atmosphere. A new method of calibrating this instrument, and measurements made in 1949 at Paris and Pic du Midi, are described and presented graphically in comparison with results of radiosonde observations (Trappes, etc.) Diurnal variation is shown for Paris for January, April and July compared with Friedrichshafen data obtained by W. Peppler. Comparison also made with results at Zi-Ka-Wei (China). Conclusions given. *Subject Headings:* **Precipitable water, Water vapor, Atmospheric structure, France.**—*M.R.*

2.2–43 551.510.42:551.593.54

Simpson, R. H., **A phenomenal haze in the Pacific.** *Weatherwise*, 3(4):83–84, Aug. **1950.** Photo. **MH-BH**—Account of synoptic weather conditions and analyses of air composition made during the period of unusually low visibility at Honolulu, Midway, Wake, Guam, Johnston Island, etc. (June 8–14, 1950). Believed to be due to salt and ash particles resulting from eruption of Mauna Loa about the first of June. *Subject Headings:* **Haze, Volcanic dust, Mauna Loa, Hawaii.**—*M.R.*

2.2–44 551.510.5:551.586:58

Schneider-Carius, Karl, **Die Grundschicht der Atmosphäre als Lebensraum.** [The ground-layer of the atmosphere as living space.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 2(3):174–187, **1950.** 2 figs., 13 refs. German, English and French summaries p. 174–175. **DWB**—The relation between the upper tree limit and the vertical structure of the atmosphere is investigated at Kilimanjaro (Central Africa) and is found to coincide with the "peplopause" and haze limit, and the level of stratus clouds. A similar relation is found in Java where the fog forest lies between 1½ and 2½ km. and the Tien Shan Mountains (Central Asia) where the snow forest is above desert at 1.8–2.8 km. Above the peplopause is dry steppe and grass. Author, therefore, adds to Köppen's climatic types a mountain "cloud zone" G of the ground layer and an Alpine steppe zone H above it. The basal ground layer is vital for the development of life; without it the earth would be steppe or desert. *Subject Headings:* **Atmospheric structure, Plant ecology, Climatic classification.**—*C.E.P.B.*

2.2–45 551.510:523

†ten Brüggencate, Paul (Sr. author), **Astronomy, astrophysics and cosmogony.** Wiesbaden, Office of Military Government for Germany, British, French, U. S., Field Information Agencies Technical, **1948.** 441 p. numerous figs., tables, refs., and equations. (*FIAT Review of German Science*, 1939–1946) **DLC**—Contains following articles (in German):

1. Schütte, K., **Determination of geographical position,** p. 1–30.
2. Lange, E., **Time service,** p. 31–42.
3. Stumpff, K., **Celestial mechanics,** p. 43–74.
4. Kohlschütter, A., **Astronometry,** p. 75–92.
5. Becker, F., Gallnow, H., and Haffner, H., **Photometry and spectroscopy,** p. 93–118.
6. Biermann, L. and Wellmann, P., **Physics of the stellar atmospheres,** p. 119–160.
7. Biermann, L., **Internal constitution of stars,** p. 161–180.
8. ten Brüggencate, P. and von Klüber, H., **Physics of the sun,** p. 181–228.
9. Kiepenheuer, K. O., **Solar terrestrial phenomena,** p. 229–284.
10. Schoenberg, E. and Wurm, K., **Solar system,** p. 285–314.
11. Hapmann, J., **Double stars,** p. 315–334.
12. Hellerich, J., **Variable stars,** p. 335–356.
13. Becker, W. and Fricke, W., **Structure of the stellar system,** p. 357–392.
14. Heckmann, O., **Statistical dynamics of stellar systems,** p. 393–412.
15. von Weizäcker, C. F., **Cosmogony,** p. 413–426.

Chap. 6 contains a section on research made in Germany (1939–1946) on *turbulence in stellar atmospheres* and chap. 8 sections on sunspots, corona and the magnetic field. Chap. 10 has sections which discuss the work on atmospheres or climatic conditions on the planets and on meteors, the zodiacal light, comets, etc. *Subject Headings:* **Stellar atmospheres, Astrophysics.** —*M.R.*

2.2–46 551.510.5:551.510.53

Shellard, H. C. and Brewer, W. A., **Evidence for a world circulation.** *Royal Meteorological Society, Quarterly Journal*, 76(330):484–487, Oct. **1950.** 2 figs., 2 refs. **MH-BH**—Correspondence between SHELLARD and BREWER about effect of recent data on Brewer's paper in *Quarterly Journal*, Oct. 1949 (*see item* 2–60, *Meteorological Abstracts and Bibliography* 1(2), Feb. 1950). *Subject Headings:* **Atmospheric structure, Stratosphere, Global circulation.**

2.2–47 551.510.53

Penndorf, Rudolf, **Die vertikale Druck- und Temperaturverteilung bis 120 km Höhe über Neu Mexico (USA) 2. Mitteilung.** [The vertical pressure and temperature distribution up to a height of 120 km. in New Mexico (U.S.A.) 2nd paper.] *Annalen der Meteorologie*, 3(7–8):241–243, **1950.** 2 figs., table, 6 refs. German and English summaries p. 241. **DWB**—New pressure measurements are discussed, that at 160 km. being given as 10^{-6} mm. Hg. As in earlier results, temperature is found to be +3°C. or less at 100 km. (above a low min. at 70–80 km.). At 50 km. temperatures are: summer, Alaska +19°C., Bermuda, −20°C; winter, Alaska, −45°C. A table is given of winds 20–60 km. in Panama, Bermuda and Alaska. *Subject Headings:* **Upper air temperature, Upper air pressure.**—*C.E.P.B.*

OZONE

2.2–48 551.510.534:551.524.7

Zeller, K., **Kritische Bemerkung zur Frage der Temperaturabhängigkeit der Ozonverteilung.** [Critical remarks on the problem of thermal dependence of ozone distribution.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 2(4):401–403, **1950.** 2 refs., 8 equations. German, English and French summaries p. 401. **DWB**—Author examines A. and E. Vassy's equation $e = J \cdot K(T)$ where e is reduced thickness of ozone layer, J is incoming radiation and $K(T)$ a function of temperature. Log $K(T)$ should be written in the form $a/T+b$ and the neglect of the term b introduces errors in the equation. *Subject Headings:* **Ozone layer, Upper air temperature.**—*C.E.P.B.*

2.2–49 551.510.534

*†Fritz, Sigmund and Stevens, Gene C., **Atmospheric ozone at Washington, D. C.** *Monthly Weather Review*, 78(8):135–147, Aug. **1950.** 10 figs., 2 tables, 23 refs., 3 equations. **DWB**—Based on data obtained since February 1948 by the U. S. Weather Bureau at Washington, D. C. with a Dobson ozone spectrophotometer, the annual variability in ozone is determined and found to be normal. The distribution of ozone around surface pressure systems is examined. It was found that the distribution around *lows* was normal but around *highs* different from results obtained in other places. Amount of ozone in relation to upper air temperature and wind (500 and 100 mb. levels) is discussed and an explanation of the spring maximum and summer minimum suggested as due to advection or vertical motion as well as annual variation in amount of ozone. Characteristics of and possible errors in instruments and observations discussed. Daily data presented in tables and scatter diagrams. *Subject Headings:* **Ozone variations, Washington, D. C.**—*M.R.*

2.2–50 551.510.534:551.524.7

Dütsch, H. U., **Der Einfluss der Temperatur auf das atmosphärische Ozon.** [Influence of temperature on the atmospheric ozone.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 2(4):386–400, **1950.** 4 tables, 18 refs., 18 equations. German, English and French summaries p. 386–387. **DWB**—Author investigated the theory of A. and E. Vassy that the total amount of ozone in the atmosphere depends on the temperature at 30 km. and the

total incoming solar energy. Basing his calculations on the photochemical theory, he finds that the Vassys' empirical formula greatly overestimates the total amount of ozone, and also the influence of the seasonal changes in the height of the sun. *Subject Headings:* **Ozone layer, Upper air temperature.**—*C.E.P.B.*

2.2–51 551.510.41

Matsui, H., **Atmospheric ozone (I and II).** *Meteorological Society of Japan, Journal, 2nd Ser.*, 27(12):381–383, Dec. **1949.** ref. In Japanese, English summary p. 40. **MH-BH**—I. Author studied effect of other oxidizing agents on measurements of surface ozone. II. In Kanagawa average amount (surface) is 1.5×10^{-8} gm./l., max. in winter. Possibly affected by air mass. *Subject Headings:* **Ozone, Japan.**—*C.E.P.B.*

2.2–52 551.510.534:551.554:551.511

Reed, Richard J., **The role of vertical motions in ozone-weather relationships.** *Journal of Meteorology*, 7(4):263–267, Aug. **1950.** 5 figs., 11 refs. **MH-BH**—The literature on the relationship between daily fluctuations in ozone amount and weather conditions and temperature and potential temperature in tropopause and lower stratosphere is summarized. A method based on the concept of ozone mixing ratio, for calculating the effect of atmospheric vertical motion on ozone fluctuations, is presented. It is shown that the vertical motions account for at most one third of the range of daily ozone amount variations and the remainder is produced by horizontal advection. The manner in which vertical motion and horizontal advection operate to produce the ozone weather relationship is explained. *Subject Headings:* **Ozone variations, Vertical motion, Thermodynamics of the atmosphere.**—*I.L.D.*

IONOSPHERE

2.2–53 550.38.5:551.510.535

Appleton, Sir Edward, **Magnetic and ionospheric storms.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(1–2):113–119, **1950.** 4 figs., table, 3 refs. English, German and French summaries p. 113–114. **DWB**—The characteristic variations of relative critical frequencies and K magnetic indexes at Slough during an ionospheric storm are described and the variation in different seasons and latitudes referred to. Variations of F2 ionization at sites more than a few hundred miles apart show little correlation. This is attributed to the fact that ionospheric storms vary in sign and magnitude with geomagnetic latitude and also have a diurnal control by local time. *Subject Headings:* **Magnetic storms, Ionospheric storms.**—*C.E.P.B.*

2.2–54 551.510.535

Bolle, A., Silleni, S. and Tiberio, C. A., **Registrazioni ionosferiche.** [Ionospheric records.] *Annali di Geofisica*, 2(3):377–387, July **1949.** 11 figs., table, 9 refs., 12 equations. **MH-BH**—Forecast (made in Washington) and recorded (at Rome) values of F2 perturbations are shown in numerous graphs (Oct. 1948–Feb. 1949). Forecasts of critical ionospheric F2-frequencies and perturbations made by the Central Radio Propagation Laboratory of the National Bureau of Standards (Washington) for period Sept. 1948–March 1949 are compared graphically with the values measured at Rome. *Subject Headings:* **Ionospheric records, F layer, Washington, D. C., Rome.**—*M.R.*

2.2–55 551.510.535:551.594.5

Eyfrig, R., **La perturbation ionosphérique causée par l'aurore boréale du 20–21 février 1950.** [Ionospheric perturbation caused by the aurora borealis of February 20–21, 1950.] *Annales de Géophysique*, 6(1):70–73, Jan.–March **1950.** 2 figs. **MH-BH**—The author discusses ionospheric disturbances produced at latitude 48°N by an aurora borealis. From an analysis of two echoes it was concluded that the concentration of electrons in the E layer was 3.10^4 per cubic centimeter and the height of this layer was 140 km. The concentration of electrons in the F2 layer was very high. *Subject Headings:* **Ionospheric disturbances, F layer, Aurora borealis.**—*I.L.D.*

2.2–56 551.510.535

Gallet, R., **Sur l'effect de longitude dans la couche F2 de l'ionosphère.** [On the effect of longitude in the F2 layer of the ionosphere.] *Annales de Géophysique*, 5(3):220–225, July–Sept. **1949.** 7 figs., table, 5 refs. **MH-BH**—The author discussed the conclusions of Appleton and Bailey that the symmetry of ionization in the F2 layer, which is observed at places on the same geographical latitude but on different longitudes and at places situated in the same longitude but at latitudes equally distant north and south of the equator, disappears when ionization frequency is plotted as a function of geomagnetic latitude. The validity of this statement is examined for conditions of maximum solar activity and when the criterion of critical frequency of ionization is the mean value of the number of electrons. The effect of longitude is not eliminated by the use of geomagnetic coordinates. *Subject Heading:* **Ionosphere, F layer.**—*I.L.D.*

2.2–57 551.510.535:551.590.21

Gallet, R. and Rawer, K., **La relation à longue période entre l'ionisation de la couche F2 et l'activité solaire, sur l'ensemble du globe.** [Relation of long period between the ionization of the F2 layer and solar activity on the whole globe.] *Annales de Géophysique*, 6(2):104–114, April–June **1950.** 4 figs., table, 8 refs., 12 equations. French and English summaries p. 104. **MH-BH**—The authors derive a simple and precise empirical relationship between the relative sunspot numbers of Wolf and the mean density of electrons in the F2 layer (mean value for a month). The systematic variations of the parameters of the equations of linear correlations as a result of geographical and geomagnetical latitude and magnetic inclination are discussed. *Subject Headings:* **Ionization, F layer, Sunspots,** —*I.L.D.*

2.2–58 551.510.535

Gerson, N. C., **Large-scale sporadic movements of the E-layer of the ionosphere.** *Nature, London*, 166(4216):316–317, Aug. 19, **1950.** fig. **DLC**—Letter giving preliminary results. Four regions were tracked over the U. S. on May 15–16, 1949. Suggestion of anticyclonic motion. *Subject Headings:* **Ionospheric layers, E layer.**

2.2–59 551.510.535

Stranz, Dietrich, **The lowest of the ionized layers of the upper atmosphere.** *Tellus*, 2(3):150–157, Aug. **1950.** 4 tables, 25 refs. **DWB**—The effects of ionization on chemical composition of the layer from 75 to 100 km. height (D layer) and on electron density, absorption, radio propagation, etc. are treated. Various theories of the formation of the D layer are discussed. *Subject Headings:* **Ionosphere, D layer.**—*M.R.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

2.2–60 551.511:551.513:551.558.21

Bolin, B., **On the influence of the earth's orography on the general character of the westerlies.** *Tellus*, 2(3):184–195, Aug. **1950.** 9 figs., 18 refs., 28 equations. **DWB**—Theoretical studies by QUENEY, CHARNEY and ELIASSEN on the dynamic effect of a mountain range on the long waves in the westerlies are extended by the author to show that whereas only mountains of the dimensions of the Rockies (or Andes) are of importance for the generation of planetary waves in the westerlies, climatic effects would be found not only in the immediate vicinity but as far away as the Azores and Western Europe. *Subject Headings:* **Zonal circulation, Waves in the westerlies, Orographic effects.**—*M.R.*

2.2–61 551.511:532.5

Fultz, Dave, **Experimental studies of a Polar vortex I.** *Tellus*, 2(3):137–149, Aug. **1950.** 15 figs. (3 col.), 5 refs., 18 equations. **DWB**—A complete, illustrated article on the subject first reported in an article which was abstracted in *item* 3–43, *Meteorological Abstracts and Bibliography*, 1(3), March 1950. The elaborate equipment was devised at the University of Chicago and experiments were performed during 1949 and 1950 in an attempt to show the effect of the Coriolis force on a vortex by simulating in the laboratory a simple polar vortex in a thin shell of fluid being heated from below. Results discussed and shown in diagrams. *Subject Headings:* **Planetary circulation, Polar vortexes, Fluid mechanics.**—*M.R.*

2.2–62 551.511:551.515:551.509.311

Godson, Warren L., **Generalized criteria for dynamic instability.** *Journal of Meteorology*, 7(4):268–278, Aug. **1950.** 18 figs., refs., 62 equations. **MH-BH**—The "perturbed-parcel" concept which has been used to predict the consequences of vertical instability is applied to assessing the results of the release of quasi-horizontal or dynamic instability in unsaturated air. The equation of motion of a perturbed air parcel is developed and the solutions of the isentropic component of relative motion are presented. The criteria for dynamic instability are shown to depend upon the three-dimensional gradients of temperature, geostrophic wind and latitude. Origin and characteristics of various types of stability and instability are discussed. Methods for computing the stability criterion parameters are presented. These methods and the generalized criteria are applied also to saturated air. The author concludes that marked dynamic instability is associated with a region of mass depletion or "perturbation divergence" and hence with weakening of anticyclones and with formation or deepening of cyclones. *Subject Headings:* **Dynamic instability, Dynamics of the atmosphere, Atmospheric disturbances.** —*I.L.D.*

2.2–63 551.511:551.513

Perkins, D. T., **On the solutions of the equations of motion for linear fields.** *Journal of Meteorology*, 7(4):291–303, Aug. **1950.** 4 figs., table of symbols, 13 refs., 40 equations. **MH-BH**—The author considers the problem of whether spatial second derivatives and mixed second derivatives of the isobaric height with respect to space and time provide a better approximation to the actual wind at a given height of field contours than does the geostrophic wind equation. A general solution is given to the equations of horizontal motion by assuming that the geostrophic wind is given by a stream function which is a second order polynomial in x, y and t, and by neglecting variations of the Coriolis parameter. The method of reducing the general solution into eccentric and central components is presented. The central field formula is developed and both theoretical and physical arguments are given for regarding it as a practical approximation to the actual wind. The application of the central wind formulas and their limitations is discussed. *Subject Headings:* **General circulation, Geostrophic winds.** —*I.L.D.*

2.2–64 551.511:532.59

Raethjen, P., **Über C. L. Godskes Dreischichtwellen und ihre Anwendung auf die Atmosphäre.** [C. L. Godske's three layer waves and their application to the atmosphere.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 2(4):426–435, **1950.** 6 refs., 4 equations. German, English and French summaries p. 426. **DWB**—Godske (**On the coupling of shearing instability and static stability in fluid motions. I. Homogeneous and incompressible fluids.** *Bergens Museums Årbok* 1945, No. 4 [1947]) considered all possible waves in a simple nonrotating fluid model with three layers flowing one over another. The atmosphere can at times be regarded as 3-layer, including a frontal boundary, and author tries to apply Godske's results. He works out four examples of wave motion, introducing the effect of Coriolis force, applicable to cyclones, and concludes that frontal cyclones are not three-layer waves of this type. *Subject Headings:* **Dynamics of the atmosphere, Fluid mechanics.**—*C.E.P.B.*

2.2–65 551.511:551.513.1

Starr, Victor P., **Geostrophic departures in the jet stream.** *Tellus*, 2(3):233–235, Aug. **1950.** 3 refs., 13 equations. **DWB**—The effect of gradients in the cross current eddy motions on the geostrophic balance is illustrated by means of an integrated model. It is suggested that gradients of the Reynolds stress associated with such eddy motions in the atmosphere and in the oceans may lead to sensible average geostrophic departures which appear as a normal inertial effect in eddying currents. *Subject Headings:* **Jet stream, Geostrophic winds.**— *Author's abstract.*

GENERAL CIRCULATION

2.2–66 551.513

Kuo, Hsiao-lan, **The motion of atmospheric vortices and the general circulation.** *Journal of Meteorology*, 7(4):247–258, Aug. **1950.** 5 figs., 12 refs., 31 equations. **MH-BH, DWB**—This article is a theoretical and mathematical study of the motions of atmospheric vortices

and their bearing upon the origin and nature of the general circulation. The motion of a vortex with a solid boundary in a uniform absolute vorticity field; and the effect of non uniform distribution of absolute vorticity, divergence, spherical shape of the earth and surface friction upon the motion of a vortex without a solid boundary are analyzed. An explanation is presented for the movement of cyclonic vortices northward and anticyclonic vortices southward in the Northern Hemisphere. The formation and motion of cut-off lows and highs in the upper atmosphere are discussed and the formation of westerlies and easterlies is explained by the transfer of vorticity and the conservation of total angular momentum. *Subject Headings:* **General circulation, Vorticity, Jet stream.**—*I.L.D.*

2.2–67 551.513:551.588

Boffi, Jorge A., **Efecto de la Cordillera de los Andes en la circulación general del aire sobre la República Argentina.** [Effect of the Andean Cordillera on the general circulation of air over the Argentine Republic.] *Sociedád Cientifica Argentina, Anales*, 147(3):126–140, March **1949.** 5 figs., 3 tables, ref. English summary p. 126. **DLC**—Dynamic effect of Andes on general circulation is considered, with particular attention to seasonal effect on cyclonic storm trajectories, cyclogenesis, deepening and filling, air flow aloft, and "statistical stability" of wind from various directions. Carefully drawn charts and diagrams for Argentina are included. *Subject Headings:* **General circulation, Orographic effects, Argentina.**—*M.R.*

2.2–68 551.513.1:551.511

§Rex, Daniel F., **Blocking action in the middle troposphere and its effect upon regional climate. I. An aerological study of blocking action.** *Tellus*, 2(3):196–211, Aug. **1950.** 13 figs. (1 col.), 3 tables, 16 refs., 8 equations. **DWB**—Five cases of blocking action in the westerlies are analyzed, discussed in detail from a theoretical and a synoptic point of view, and illustrated by many charts and graphs. The processes that lead to the initiation, development and dissipation of the blocking are treated effectively. *Subject Headings:* **Blocking action, General circulation.**—*M.R.*

2.2–69 551.513.1:551.511

Yeh, Tu-cheng, **The circulation of the high troposphere over China in the winter of 1945–46.** *Tellus*, 2(3):173–183, Aug. **1950.** 13 figs., table, 14 refs. **DWB**—By means of atmospheric cross-sections based on rawinsondes made in China, Japan and adjacent areas, the author has made an intensive study of the relation between the position of the jet stream over the Far East and the attendant rainfall, movements of troughs and the circulation above and below the jets. The formation and movement of these jets in autumn, and the zonal wind distribution in winter (1945–6) are specially treated. Comparison is made between conditions in East Asia and eastern America. *Subject Headings:* **General circulation, Jet stream, Structure of the troposphere, Dynamics of the atmosphere, China.**—*M.R.*

2.2–70 551.513.1

Priestley, C. H. B., **On the dynamics of the general atmospheric circulation.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences*, 3(1):1–18, March **1950.** fig., 4 tables, 19 refs., 12 equations. **MH-BH**—A theoretical study of the relationships between zonal and meridional flow at the surface and aloft, and the location of the jet streams and the strength of the easterly drifts. Calculations are made of indexes of zonal and easterly flow, of the thermal adjustments and poleward drift. Synoptic phenomena associated with such conditions as are known to exist on a large scale, are discussed. Calculations of the poleward drift by two methods are made and compared. *Subject Headings:* **General circulation, Meridional exchange.**—*M.R.*

ATMOSPHERIC DISTURBANCES

2.2–71 551.515.11

Wagemann, Hellmut, **Rechnungen zur Zyklonentheorie.** [Calculations on the theory of cyclones.] *Meteorologische Rundschau*, 3(9–10):193–199, Sept.–Oct. **1950.** 2 figs., 12 equations. German and English summaries p. 193. **MH-BH**—The differential equations

for synoptic motion are developed, and are integrated for linear oscillations in a straight air stream, taking into consideration changes of potential temperature. These give the order of magnitude of frontal disturbances. The latter are classified according to the direction of the horizontal gradient of potential temperature. In the normal case there is a discontinuity between warm and cold air with the gradient almost the same in both. A concentric wave disturbance forms and develops into a depression at a rate proportional to the potential temperature gradient. The work is stated to provide a common physical basis for the various cyclonic theories. *Subject Headings:* **Cyclone theories, Dynamics of the atmosphere.**—*C.E.P.B.*

2.2–72 551.515.13

Reuter, H., **Über die Verlagerung einzelner abgeschlossener atmosphärischer Wirbel (Kaltlufttropfen) bei ruhender Umgebung.** [On the displacement of an isolated atmospheric vortex (cold air drop) in quiet surroundings.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(1–2):156–162, **1950.** 6 refs., 14 equations. German, English and French summaries p. 156–157. **DWB**—Rossby showed (1948, 1949) that because of the variation of the Coriolis parameter with latitude, a solitary vortex in the absence of friction must move due south (in Northern Hemisphere). Author introduces friction and shows that the effect of wind varying with height in an Ekman spiral is to cause a deviation of the track to the right up to 20°. *Subject Heading:* **Cold air sinks.**—*C.E.P.B.*

2.2–73 551.515.2

Sherman, Leon, **On the propagation of hurricanes.** *American Geophysical Union, Transactions*, 31(4):531–535, Aug. **1950.** 3 figs., tables, 10 refs., 6 equations. **MH-BH**—The velocity of propagation of a fluid disturbance is considered as consisting of convective and dynamic parts and the velocity of propagation of an extratropical cyclone is analyzed in terms of these concepts. The author then tests the hypothesis that the convective part of the velocity of propagation is so important as to determine virtually the direction of propagation of a tropical storm. The computed convective velocity is found to account for only 56 per cent of the variation in the observed directions of propagation of storms, so that the direction of propagation cannot be predicted from convective velocity alone. In the remaining variability the dynamic contribution is significant. *Subject Headings:* **Hurricane propagation, Steering.**—*I.L.D.*

2.2–74 551.515.23

Uwai, K., **Analysis of Kathleen typhoon. (II). Analysis of life history of typhoon.** *Journal of Meteorological Research*, Tokyo, 2(6):151–163, July **1950.** 9 figs., 6 refs., 20 equations. In Japanese, English summary p. 41. **MH-BH**—Typhoon originated in meridional oscillation of equatorial [?intertropical] front due to a trough in equatorial easterlies. Development is analyzed by stream lines and thermodynamically. It disappeared when the trough rose to a high level. Speed by theory of group velocity is 1–2 times speed of easterlies. *Subject Heading:* **Typhoons.**—*C.E.P.B.*

2.2–75 551.515.3(42)

Hemens, L. G., **Whirlwind at Shoeburyness.** *Meteorological Magazine, London*, 79(939): 256–260, Sept. **1950.** 3 figs. **DWB**—On Oct. 20, 1949, a whirlwind of tornado type travelled NE from Shoeburyness along coast. Wind speed record and upper air data shown; there was a thick layer of moist air below very dry air. *Subject Headings:* **Whirlwinds, England.**

2.2–76 551.515.3(42)

§Lamb, H. H., **Tornadoes of May 21, 1950.** *Meteorological Magazine, London*, 79(939):245–256, Sept. **1950.** 7 figs., 5 photos, table, 9 refs. **DWB**—Tornadoes occurred over a wide area of East England, travelling NE. Three were well-developed, others incipient. Damage estimated at £50,000. One photo shows hailstones up to 2 inches diameter. Autographic records near tracks and synoptic charts are given. Maximum gust $\frac{3}{4}$ mile from track 51 kts. Upper air records show great instability and vertical currents at low levels in unstable moist African tropical air in a frontogenetic situation. The paper ends with a summary of the

incidence of tornadoes in the British Isles (daily, annual and secular variations). *Subject Headings:* **Tornadoes, England.**

2.2–77 551.515.3(43)

Whirlwind near Walsrode, Germany. *Meteorological Magazine, London,* 79(939):267–268, Sept. **1950. DWB**—Small sudden whirlwind within an area of 200 sq. yds. on April 26, 1950. *Subject Headings:* **Whirlwinds, Germany.**

2.2–78 551.515.7:551.509.33

Tajima, S., **On the structure of subtropical anticyclone in East Asia and in the North Pacific Ocean.** *Journal of Meteorological Research,* Tokyo, 2(6):164–168, July **1950.** 6 figs., 2 tables, 9 refs. In Japanese, English summary p. 41. **MH-BH**—From frequency distribution in latitude (peaks 28–29 and 32–34°N) anticyclone is regarded as made of two highs, one of subtropical, the other of mid-latitude origin; this is supported by sea temperature and upper air data. Of interest to forecasting summer in Japan. *Subject Headings:* **Anticyclones, Long range forecasting, East Asia, North Pacific Ocean.**—*C.E.P.B.*

2.2–79 551.515.8

§Parry, Dean H. and Norton, Lewis C., **An unusual surge of cold air across the northwest United States on August 22 and 23, 1950.** *Monthly Weather Review,* 78(8):156–160, Aug. **1950.** 12 figs., 5 refs. **DWB**—A detailed synoptic and dynamic analysis of a situation which produced an unpredicted temperature drop in the Columbia Basin and Northern Rockies on August 23, 1950. Surface and 700 mb. charts for August 15–23 are re-analyzed and those for Aug. 20–23 reproduced along with charts showing temperature change and a composite chart of successive positions of the cold front as it moved from Kamchatka across the Pacific and invaded the Northwest. *Subject Headings:* **Cold fronts, Synoptic studies, Pacific Northwest.**—*M.R.*

RADIATION AND TEMPERATURE

RADIATION

2.2–80 551.521.1:551.586:612

Zhikharev, S. S., **Reaktsii kozhi na deĭstvie luchistoĭ energii v vysokogornom klimate.** [Reaction of the skin to radiant energy in a mountain climate.] (In **Trudy El'brusskoĭ Ekspeditsii Akademii Nauk, SSSR i Vsesoiuznogo Instituta Eksperimental'noĭ Meditsiny, 1934 i 1935.** [Reports of the Elbrus Expedition 1934 and 1935.] Moscow, **1936.** p. 487–511. 8 figs., 10 tables, 33 refs. English summary p. 510–511. [*Ak. Nauk, SSSR, Komissiia po izucheniiu stratosfery,* Tom II]) **DLC**—Greater intensity of ultraviolet radiation and increased sensitivity of the skin at an altitude above 4300 m. accelerate the formation of skin erythema. Diffuse solar radiation and reflected radiation from a snow field produce erythema more slowly than total solar radiation. Ultraviolet radiation of wave length greater than those producing erythema produce a grey coloration of the skin. *Subject Headings:* **Physiological climatology, Solar radiation effects, Ultraviolet radiation, Elbrus Expedition.**—*I.L.D.*

2.2–81 551.521.1:551.586:612

Zhukov, A. P. and Frank, G. M., **Fiziologicheskie issledovaniia na El'bruse.** [Physiological investigations on the Elbrus.] (In **Trudy El'brusskoĭ Ekspeditsii Akademii Nauk, SSSR, i Vsesoiuznogo Instituta Eksperimental'noĭ Meditsiny 1934 i 1935.** [Reports of the Elbrus Expedition 1934 and 1935.] Moscow, **1936.** p. 299–312. 2 photos. English summary p. 311–312. [*Ak. Nauk, SSSR, Komissiia po izucheniiu stratosfery,* Tom II]) **DLC**—This is a summary of investigations dealing with the effect of high altitude climate upon various physiological functions of human beings. These included studies on acclimatization at altitudes of 4250 meters; on mountain sickness and on the effect of high altitude upon muscular activity, gaseous exchange, sensations of taste, hearing and vision and the autonomic venous system, With a view of analyzing the role of individual climatic elements a detailed

study was made of the action of solar radiation upon the skin. *Subject Headings:* **Physiological climatology, Solar radiation effects, Atmospheric pressure, Acclimatization, Elbrus Expedition, U.S.S.R.**—*I.L.D.*

2.2–82 551.521.32

Yamamoto, Gi-ichi, **On nocturnal radiation. Part I, Theoretical consideration.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 28(1):1–11, Jan. **1950.** fig., 5 tables, 37 equations. **MH-BH**—Using absorption coefficients of water vapor (Yamomoto-Onishi and Elsasser), CO_2 and O_3, incoming atmospheric radiation with clear skies was calculated and compared with observations. Calculation gave incoming radiation as:

$$(1-0.76\times10^{-\cdot253W})/T_0^4 \ (W=\text{cm. precipitable water})$$

Observation gave: $(0.51+.066T_0^4)$ (=surface vapor pressure, mb.). *Subject Headings:* **Global radiation, Nocturnal radiation.**—*C.E.P.B.*

2.2–83 551.521.32

Czepa, O. and Reuter, H., **Über den Betrag der effektiven Ausstrahlung in Bodennähe bei klarem Himmel.** [On the calculation of the effective outward radiation near the ground with a clear sky.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 2(3):250–258, **1950.** fig., 6 tables, 14 refs. German, English and French summaries p. 250–251. **DWB**—Using the radiosonde ascents at Tulln (Lower Austria), mostly 4 times daily on clear days Feb.–March and Aug.–Sept. 1949, the outward atmospheric radiation was calculated by the Elsasser radiation chart. The effective night radiation was .09–.12 cal./cm.²/min., lower than given by Ångström's formula and slightly higher than the night radiation balance on the ground found by SAUBERER. Variations during the day (about 30%) exceed seasonal changes. The contributions of the different layers of the atmosphere are discussed from Lindenberg data; the lowest 87 meters are responsible for most of the radiation. *Subject Headings:* **Outgoing radiation, Nocturnal radiation, Tulln, Austria.**—*C.E.P.B.*

2.2–84 551.521.64 551.515 551.510.535

Bureau, Robert and Dauvillier, Alexandre, **L'éruption chromosphérique du 19 novembre 1949 et ses conséquences géophysiques.** [Chromospheric flare on November 19, 1949 and its geophysical consequences.] *Annales de Géophysique*, 6(2):77–103, April–June **1950.** 9 figs., 29 refs. French and English summaries p. 77. **MH-BH**—In the first part of this article R. BUREAU discusses the observed correlation between chromospheric flare and an ionospheric disturbance, which is marked by the sudden fading of short radio waves and the sudden intensification of long waves. In the second part A. DAUVILLIER describes especially designed apparatus and methods for studying the intensity of cosmic radiation of the earth's electro-magnetic field and the barometric pressure. The behavior of the cosmic radiation and the earth's electromagnetic field in the course of a chromospheric flare and the possible origin of cosmic radiation are discussed. *Subject Headings:* **Ionospheric disturbances, Cosmic radiation.**—*I.L.D.*

2.2–85 551.521.64

Tielsch, Herbert, **Beeinflussung der Ultrastrahlung durch das Wetter nach Messungen während der Jahre 1932/34 zu Königsberg (Pr.).** [Effect of weather upon cosmic radiation according to measurements during 1932/34 at Königsberg (Pr.).] *Germany, Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 4(2), **1938.** 21 p. 12 figs., 12 tables, numerous refs. **DLC**—The effect of various meteorological factors upon the intensity of cosmic radiation was investigated by means of an ionization chamber under completely shielded and partially shielded conditions. Sensitivity of apparatus increases with rising room temperature. Increasing barometric pressure, increasing water vapor pressure and increasing depth of snow cover reduce ionization intensity of radiation. Cloudiness increases ionization intensity, insolation diminishes it; maximum intensity of ionization during SW wind, minimum during NW wind. From 1932 to 1934 intensity of radiation declined 1.2 percent per month. Maximum ionization intensity at 3 o'clock sidereal time and minimum at 15 o'clock. On the basis

of Central European Time, ionization intensity is greater during the day than at night. Daily march of ionization intensity is determined by daily march of water vapor pressure. *Subject Headings:* **Meteorological influences, Cosmic radiation, Kaliningrad, U.S.S.R.**—*I.L.D.*

TEMPERATURE

2.2–86 551.524:551.586:633.1

Sapozhnikova, Serafima Afanas'evna, **Kharakteristika nekotorykh osobennosteĭ teplovogo balansa pshenichnogo polia primenitel'no k sel'skokhoziaĭstvennoĭ otsenke klimata.** [Characteristics of the heat balance of a wheat field applicable to the agricultural evaluation of climate.] *Problemy Fizicheskoĭ Geografii*, 13:156–163, 1948. 5 figs., 3 tables, 9 refs. **DLC**—The heat balance of a wheat field during the growing season can be determined from the radiational balance and its components, namely, the heat expended in warming the soil plants and air and in evaporation. The determination of evaporation from a wheat field is discussed. From northwest to southeast of the European U.S.S.R., the radiation balance during the day increases, evaporation diminishes, height of spring wheat decreases and quantity of heat expended in warming the soil decreases. The northern limit of wheat is determined by the lack of sufficient heat for the transpiration needs of the plant. Limitation can be overcome by adjusting the transpiration of plant to available heat resources. Several methods of reducing transpiration are discussed. *Subject Headings:* **Energy exchange, Agricultural climatology, U.S.S.R.**—*I.L.D.*

2.2–87 551.524.37:551.311.181

Nusser, Franz, **Gebiete gleicher Eisvorbereitungszeit an den deutschen Küsten.** [Regions of equal duration of ice formation on the German coasts.] *Deutsche Hydrographische Zeitschrift*, 3(3–4):220–227, 1950. 2 charts (fold. in pocket), 2 tables, 10 refs. German and English summaries p. 220. **DWB**—Author investigated average number of consecutive days with mean temperature below 0°C. required for formation of first sea ice. The results (mean of 28 years) are shown in two charts; time varies from 2 to 15 days, being least in shallow water (German bight of North Sea), especially on banks which dry at low water. *Subject Headings:* **Freezing temperatures, Sea ice, North Sea, German Coasts.**—*C.E.P.B.*

2.2–88 551.524.3:551.588.4(77)

Barton, Byron Kurtz, **An analysis of spring weather conditions on east and west shores of Lake Michigan.** (In **Abstracts of Doctoral Dissertations.** Lincoln University of Nebraska, 1949. p. 70–77. fig., table.) **DLC**—Records for 17 stations, 9 of which are on the shores of Lake Michigan, indicate that there is little difference between temperature conditions on the east and on the west shores of the lake; but there is a great difference between shore and inland stations on either side. This is thought to be due to the fact that in spring prevailing winds are onshore on both sides of the lake. *Subject Headings:* **Temperature variations, Marine influences, Lake Michigan Region.**—*M.R.*

2.2–89 551.524.32

Mämecke, Karlheinz, **Über die Verteilung von zwei Temperaturperioden in Thüringen.** [On the distribution of two temperature intervals in Thuringia.] *Meteorologische Rundschau*, 3(9–10):222–223, Sept.–Oct. 1950. 3 tables, 2 refs. **DWB, MH-BH**—Sets out dates of beginning and end of temperatures above 5° and 10°C. for a number of stations at different heights, and rates of change of date with height. *Subject Headings:* **Temperature variations, Thuringia, Germany.**—*C.E.P.B.*

2.2–90 551.525.2

†*Penta, Francesco, **Temperature nel sottosuolo della regione "Flegrea."** [Earth temperature in the Phlegraean Plains.] *Annali di Geofisica*, 2(3):328–346, July 1949. 7 figs., 7 photos, 6 tables, 22 refs. **MH-BH**—Results of measurements made from 1939–1943 on the island of Ischia and adjacent mainland region (near Naples). Temperatures were measured to about 700 m. depth in the vicinity of fumaroles and geysers, in order to determine the energy available in the earth. Graph shows temperature depth measurements down to 96 m.

at Ischia. Illustrations show location of measuring points and topography. *Subject Headings:* **Earth temperatures, Italy.**—*M.R.*

2.2–91 551.525.4:631.4

Kolmogorov, A. N., **K voprosu ob opredelenii koeffitsienta temperaturoprovodnosti pochvy.** [The determination of the coefficient of heat conductivity in the soil.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geogr. i Geofiz.*, 14(2):97–98, March–April **1950.** table, ref., 5 equations. **DLC**—A criticism of the method of determining the conductivity of the soil (by measuring the temperature at four six-hourly intervals at two different depths) proposed by KAGANOR and CHUDNOVSKIĬ. The difficulty encountered in this method of using the variation of the diurnal temperature wave with depth is that of making observations in which the phase will be less than 180°. However, by extending the formula to take into consideration the change in amplitude, satisfactory results can be obtained. *Subject Heading:* **Soil conductivity.** —*M.R.*

2.2–92 551.525.5:551.579.4:551.588.6(79)

Hale, Charles E., **Some observations on soil freezing in forest and range lands of the Pacific Northwest.** Portland, Oregon, *Pacific Northwest Forest and Range Experiment Station, Research Notes*, No. 66, July **1950.** 17 p. 11 figs., 5 tables, 7 refs. **MH-BH**—Describes extent and kind of soil freezing under various forest and range types in Oregon and Washington during the severe winter of 1949–50. Soils of the high Cascade Mountain forests remained unfrozen; discontinuous permeable frost occurred in the lower ponderosa pine and grass type; and up to 7.5 inches of impermeable frost occurred in the sagebrush and grass types during the winter and spring snow melt period. One inch of impermeable "concrete" frost was sufficient to cause surface runoff from snow melt. Other observations showed that intensity of timber cutting had a decided effect on snow accumulation and recession in the Douglas-fir forest. Snow in depths over two feet afforded protection against soil freezing. *Subject Headings:* **Frozen soil, Runoff, Forest influences, Pacific Northwest.**—*Author's abstract.*

ATMOSPHERIC PRESSURE AND WIND

PRESSURE

2.2–93 551.541:550.342

†*Båth, Markus, **An investigation of the Uppsala microseisms.** Uppsala, Almquist & Wiksells Boktryckeri AB, **1949.** 168 p. 37 figs., 36 tables, 58 refs., 10+ equations. (*Sweden, (K.) Universitetet, Meteorologiska Institutionen, Meddelande*, No. 14) **MH-BH**—An elaborate study of the many aspects of microseismic phenomena, including comparative data on frequencies, amplitude, long period, annual and diurnal variations, etc. Then there are two chapters on the relation between microseisms and gradient winds over Scandinavia. Twenty-two types of pressure distribution are illustrated and the relation of these types to microseisms are analyzed statistically. Other factors such as effective coast length, pressure effect and energy transformation are considered. Finally, 4 individual cases are examined and illustrated. Based on extensive data from 1921–1938, conclusion is that microseisms result from both wave action (along the coast of Norway) and the dynamic effect of barometric pressure in cyclones off the coast. Useful bibliography appended. *Subject Headings:* **Microseisms, Atmospheric disturbances, Pressure variations, Uppsala, Sweden.**—*M.R.*

2.2–94 551.543:551.515.1

§Evjen, Sigurd, **On the use of areas of rising and falling pressure in the free atmosphere.** *Tellus*, 2(3):212–221, Aug. **1950.** 10 figs., table, 2 refs., 10 equations. **DWB**—Rules promulgated by SUTCLIFFE and PETTERSSEN are applied to the analysis of upper air charts by the Norwegian Meteorological Institute at Oslo. These rules, specifically those for forecasting isallobaric movements, are listed and the mechanism by which the upper air isallobaric movements affect sea level pressure changes is discussed and illustrated by synoptic charts. *Subject Headings:* **Isallobaric analysis, Cyclogenesis.**—*M.R.*

2.2–95 551.543:551.515.11

Priestley, C. H. B., **Atmospheric pressure changes: The importance of deviations from the balanced (gradient) wind.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences*, 1(1):41–57, March **1948.** 4 figs., plate, table, 14 refs., 13 equations. **MH-BH**—Effect of horizontal accelerations and vertical motion on surface pressure movements and changes. Horizontal accelerations are effective mainly in counteracting surface friction, but also contribute to movement and deepening of anticyclones, cyclones, secondaries and cold pools. The importance of radiation, motions of the tropopause and in the stratosphere, and of other effects of deviations from the gradient wind, are discussed theoretically. *Subject Headings:* **Pressure changes, Dynamics of the atmosphere.**—*M.R.*

WIND

2.2–96 551.55:551.594.11

Cialdea, R., Lo Surdo, Antonino and Zanotelli, G., **La carica delle sonde radioattive in presenza di vento.** [Changes of radioactivity of a sphere due to wind.] *Annali di Geofisica*, 2(3):317–327, July **1949.** 4 figs., tables, 10 refs., 13 equations. **MH-BH**—Measurements of electric potential by means of a radioactive sphere are substantially affected by a strong wind blowing parallel to the lines of the electric field. Light winds are not so effective in reducing the charge. *Subject Headings:* **Wind effects, Potential gradient.**—*M.R.*

2.2–97 551.551

Batchelor, G. K., **Diffusion in a field of homogenous turbulence. I. Eulerian analysis.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences*, 2(4):437–450, Dec. **1949.** fig., 15 refs., 5 equations. **MH-BH**—A development of the statistical theory concerning the increase in width of a heat wake with distance from a fixed heated obstacle in a turbulent stream. Conclusions agree with SUTTON's (1932). The diffusion is represented by a differential equation of the heat conduction type, with a coefficient which increases asymptotically with time. *Subject Headings:* **Turbulence, Eddy diffusion.**—*M.R.*

2.2–98 551.551

*Peppler, Wilhelm, **Die Böigkeit in der freien Atmosphäre nach den Beobachtungen in den Jahren 1931–1935.** [Gustiness in the free atmosphere according to observations of 1931–1935.] *Germany, Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 5(6), **1938.** 28 p. 4 figs., 30 tables. **DLC**—A statistical analysis of gustiness based upon data obtained by weather flights at Munich, Darmstadt, Berlin, Hamburg and Königsberg during 1931–1935. The author discusses the frequency of lower and upper limits of strata in which gustiness occurs; frequency of calm, of various degrees of gustiness and of mean gustiness; relationship of strata of intense gustiness to barometric pressure and gradient wind, to weather situation and to cloudiness; and strata of intense gustiness in the free atmosphere. *Subject Headings:* **Gustiness, Turbulence, Germany.**—*I.L.D.*

2.2–99 551.551:551.594

Israël, Hans, **Austauschuntersuchungen mittels luftelektrischer Messungen.** [*Austausch* investigations by means of electrical measurements.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 2(4):367–373, **1950.** 3 figs., 13 refs., 5 equations. German, English and French summaries p. 367. **DWB**—The author shows by curves the similarity in different months and seasons of the diurnal variations of vapor pressure and potential gradient (double wave at Potsdam, single on Zugspitze). This is due to the same cause, atmospheric mass exchange, which affects the concentration of both water vapor and nuclei, the latter governing the columnar resistance. The possibility of using observations of atmospheric electricity at various heights to measure the mass exchange is discussed. *Subject Headings:* **Turbulent exchange, Atmospheric electricity.**—*C.E.P.B.*

2.2–100 551.553.11

Defant, F., **Theorie der Land- und Seewinde.** [Theory of land and sea breezes.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 2(4):404–425, **1950.** 7 figs., 4 tables,

12 refs., 26 equations. German, English and French summaries p. 404. **DWB**—Land and sea breezes are the simplest form of circulation in a vertical plane. Previous theories are briefly summarized. A detailed mathematical analysis of the circulation is given, taking account of friction, deflective force of rotation and horizontal and vertical heat transport on the basis of Rayleigh's convection theory. This leads to an equation involving complex functions of constants such as vertical temperature gradient, "extension coefficient," turbulent conductivity, friction and wave length of the circulation cell. Values of these constants are given and the magnitudes of the functions calculated. The amplitude and phase of the wind components normal and parallel to the coast and vertical, and of the variation of potential temperature up to 2000 meters are calculated under various assumptions, leading to a theoretical table and vector diagram of the diurnal variation of wind across a coast. This is compared with observed hourly vectors at Hook of Holland and Logan Airport and good agreement found. *Subject Headings:* **Land and sea breezes, Wind variations.**—*C.E.P.B.*

2.2–101 551.556:551.465

Munk, Walter H. and Carrier, G. F., **The wind-driven circulation in ocean basins of various shapes.** *Tellus*, 2(3):158–167, Aug. **1950.** 12 figs., 10 refs., 19 equations. **DWB**—The equation of mass transport and the boundary conditions for a theoretical oceanic circulation, induced by zonal winds in a triangular ocean basin, are set up and solved by the boundary layer method. Theory is applied to circulation of the Pacific Ocean and the discrepancy between observed and computed transport determined. *Subject Headings:* **Wind effects, Ocean currents.**—*M.R.*

2.2–102 551.556.1:551.556.4:551.465

Sekiya, H., **The briny wind damage and its mechanism.** *Journal of Meteorological Research*, Tokyo, 2(6):169–181, July **1950.** 14 figs., 2 tables, 17 refs., 3 equations. In Japanese, English summary p. 41. **MH-BH**—Author investigates damage by salt particles from spray carried inland by Kitty typhoon. The distance salt is carried suddenly increases when wind exceeds 18 m./sec.; near the coast the damage is great but a small obstacle such as a hill gives complete protection. Damage depends on wind speed, amount of rain and height of swell. *Subject Headings:* **Wind damage, Sea spray.**—*C.E.P.B.*

2.2–103 551.558.1:551.515.4

Radok, U., **A remarkable thunderstorm flight record.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences*, 2(4):550–563, Dec. **1949.** 8 figs., table, 6 refs. **MH-BH**—Downdrifts of 130 ft./sec. were indicated by the barograph record made in a sailplane during descent in a thunderstorm at Benalla, Victoria (from 12,400 ft. to the surface). Records are reproduced and meteorological and aerological conditions discussed in detail. At 2 km. the vertical velocity of 47 m./sec. is out of all proportion to extremes recorded in Florida (Thunderstorm Project), which would indicate a probability of 1 in one million of such occurring. Conclusion is that conditions in Australia are not identical with those in Florida. *Subject Headings:* **Vertical velocities, Thunderstorm dynamics, Gliders, Victoria, Australia.**—*M.R.*

AQUEOUS VAPOR AND HYDROMETEORS

EVAPORATION

2.2–104 551.573:63 551.508.71

Horney, Günther, **Verdunstungsmessungen am freiwachsenden Pflanzenbestand.** [Evaporation measurements in a free-growing stand of plants.] *Meteorologische Rundschau*, 3(9–10):202–205, Sept.–Oct. **1950.** 4 figs., 2 tables, 4 refs., equations. **DWB, MH-BH**—Author observed the diurnal variation of radiation, temperature, vapor pressure, saturation deficit and relative humidity in fields of lucerne, potatoes and maize, and calculated the heat economy and evaporation in mm./hr. Hourly values are tabulated and graphed. A thermoelement psychrometer designed by ALBRECHT is described. *Subject Headings:* **Evaporation measurements, Agronomy, Psychrometers.**—*C.E.P.B.*

2.2–105 551.573:551.571:551.577

Steinhäusser, Hans, **Verdunstung, Sättigungsdefizit und Niederschlag. Nach Klagenfurter Beobachtungen (1896–1938).** [Evaporation, saturation deficit and precipitation. From Klagenfurt observations (1896–1938).] *Meteorologische Rundschau*, 3(9–10):205–208, Sept.–Oct. **1950.** 2 figs., 3 tables, 7 refs. **DWB, MH-BH**—Observations were made with a Wild balance in a louvred screen on a north window. Annual mean 300 mm. Figures for Kremsmünster and Swiss lakes also given. Graphs compare annual and seasonal values with saturation deficit and rainfall; correlation varies with season. Brief discussion of regional evaporation. *Subject Headings:* **Evaporation, Saturation deficit, Precipitation.**—*C.E.P.B.*

2.2–106 551.573

Gilby, A. R. and Heymann, E., **The rate of evaporation of water through duplex films.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences*, 1(2):197–212, June **1948.** 7 figs., 2 tables, 11 refs., 15 equations. **MH-BH**—Experiments on evaporation of water surfaces covered with oil films show that such films are more efficient in reducing evaporation in strong winds than in still air, and that with film thicker than 10μ a wind of even 8 m.p.h. does not increase rate of evaporation. Total evaporation resistance depends on film thickness. *Subject Heading:* **Evaporation.**—*From author's abstract.*

2.2–107 551.573:63(71)

Sanderson, Marie, **Some Canadian developments in agricultural climatology. Part I.** *Weather*, 5(11):381–388, Nov. **1950.** fig. Part. II, *ibid.*, 5(12):409–412, Dec. **1950.** 4 figs., photo, 2 tables. **DWB**—Pt. I gives an account of THORNTHWAITE's method of calculating potential evaporation from climatic data with application to Toronto. In Pt. II a test of Thornthwaite's evapotranspiration formula is described; the meter is a tank filled with gravel and soil to ground level, connected with a water supply held constant at 2 ft. below surface. Measurements at Toronto and Norman Wells on average agreed closely with formula. Applications to crop testing and irrigation described. *Subject Headings:* **Evaporation measurement, Agricultural climatology, Evapotranspiration, Canada.**

2.2–108 551.573:551.311.12

Wegener, Kurt, **Die Ursachen der Abtragung (Ablation) der Gletscher.** [The causes of decrease (ablation) of glaciers.] *Zeitschrift für Gletscherkunde und Glazialgeologie*, Innsbruck, 1(1):71–74, **1949.** ref. **MH-BH**—A discussion of the heat balance of glaciers. In Iceland, Eastern Greenland and Norway absorbed radiation is 0.06–0.14 g.cal./cm.²/min. At Winterhaus, East Greenland, summer melting was 1–4 cm./day requiring 0.5–2 g.cal./cm.²/min. *Subject Headings:* **Ablation, Evaporation, Glaciers.**—*C.E.P.B.*

CLOUD PHYSICS

2.2–109 551.574.1(417)

Nolan, P. J. and Tedde, P. G., **Condensation nuclei and meteorological elements in Dublin.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 2(4):374–385, **1950.** 3 figs., 4 tables, 16 refs., equations. English, German and French summaries p. 374. **DWB**—Using a photoelectric nucleus counter (described and illustrated), measurements of size and charge distribution were carried out near center of Dublin and compared with relative humidity and wind speed and direction. Average concentration 124,000/cm³ in winter and 57,000 in spring. Some local differences and effects of wind direction are discussed and attributed to local sources of pollution. With calm and light wind nuclei are larger and have a larger charged fraction. With increasing humidity the total number of nuclei is not affected but the large ion concentration increased; variation agrees with theoretical variation of radius of dilute sulphuric acid droplets. *Subject Headings:* **Condensation nuclei, Dublin, Ireland.**—*C.E.P.B.*

2.2–110 551.576.1

Kraus, E. B. and Smith, Betty, **Theoretical aspects of cloud drop distributions.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences*, 2(3):376–388, Sept. **1949.** 7 figs., table, 12 refs., 14 equations. **MH-BH**—A theoretical study of the relationships between

meteorological variables (temperature, pressure, humidity and wind) that affect the drop size spectrum in clouds. Effect of condensation level, rate of condensation, distribution of nuclei, sedimentation and turbulence treated in detail. Conclusion is that average drop size is larger the slower the rate of cooling, the higher the temperature and the lower the pressure. Number of nuclei is smallest in air over the oceans. *Subject Headings:* **Drop size distribution, Cloud structure.**—*M.R.*

2.2–111 551.576.1:778.5

Abe, M., **Practical use of the whole-sky kinematography.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 28(1):21–24, Jan. **1950.** 8 figs. In Japanese, English summary p. 23–24. **MH-BH**—Author describes and illustrates a kinematograph attachment to Robin Hill's whole sky lens, with automatic sun shield, and a scale for measuring direction, velocity and amount of cloud. *Subject Headings:* **Cloud photography, Meteorological films.**—*C.E.P.B.*

2.2–112 551.576.11:551.594.22

Hale, H. B., Ludlam, F. H. and Lacy, R. E., **Unusual lightning.** *Weather*, 5(11):394–395, Nov. **1950. DWB**—Several observers noted the repeated slow build-up and rapid disappearance of a cirrus-like streamer from a cu-nb. cloud. Lacy suggests that a locally intense electric field caused production of ionized particles on which ice crystals formed. The electric current accompanying discharge melted the ice. *Subject Headings:* **Cloud formation, Lightning.**

2.2–113 551.576.12

Ludlam, F. H., **The clouds.** *Weather*, 5(12):407–408, Dec. **1950.** 4 photos, 3 refs. **DWB**—Note on beauty and interest of clouds in connection with 24 photo-postcards of G. A. Clarke's **Clouds.** Clarke's collection has been acquired by the Royal Meteorological Society. *Subject Heading:* **Cloud classification.**

2.2–114 551.576.4

Schwerdtfeger, Werner, **Über die hohen Wolken.** [High clouds.] *Germany, Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 5(1), **1938.** 33+p. 3 figs., 7+3 tables, 31 refs. **DLC**—A study of the characteristics and origin of cirrus and cirrostratus clouds based upon meteorological observations made by means of airplane ascents and also upon sounding balloon data. The origin of cirrus clouds is attributed to the inflow of cold air into a layer of the upper troposphere and that of high cirrus clouds to the slow mixing and lifting processes at the boundaries of different air masses often accompanied by the penetration of warm air into the upper troposphere. These theoretical considerations are supported by data on the time sequence of temperature changes and on the high altitude circulation during the appearance of high altitude clouds. The relationship between interdiurnal changes of the geopotential at 500 mb. and the appearance of high altitude clouds is discussed. *Subject Headings:* **Clouds, Air masses.**—*I.L.D.*

RAIN

2.2–115 551.577.21:551.577.35

Maurain, Ch., **Étude sur la pluie, se rapportant à la terre entière ou à de grandes étendues.** [Study of the rainfall over the whole world or large areas.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(1–2):153–155, **1950.** French, German and English summaries p. 153. **DWB**—Author calculated mean rainfall at 64 well-distributed stations for each year 1931–1940 from World Weather Records. Variation only from 938 mm. (1940) to 991 (1931), in spite of great variation of sunspot numbers. Means of 10 stations in France gave a variation in 1851–1900 from 46 to 122% of mean. *Subject Heading:* **Precipitation distribution.**—*C.E.P.B.*

2.2–116 551.501.45:551.577.3

Arléry, R., **Sur la signification des moyennes de la pluie annuelle à Paris.** [On the significance of mean annual rainfall values for Paris.] *Journal Scientifique de la Météorologie*, 2(7):82–100, July–Sept. **1950.** 4 figs., 6 tables, 11 refs. Summaries in French, English and German p. 82. **MH-BH**—The 150-year record (1800–1949) of rainfall at Paris is subjected to

a thorough statistical analysis of variance by different methods, indicating that the 150 annual values taken as a group could be considered as randomly distributed; but applying Students *t*-test to the annual values in sequence, the succession of alternate dry and wet periods could not be ascribed to chance. *Subject Headings:* **Precipitation variations, Long period records, Statistical studies, Paris, France.**—*M.R.*

2.2–117 551.577.34

McClean, W. N., **Graphical record of rainfall on the Thames Basin.** *Institution of Water Engineers, Journal*, 4(5):432–433, Aug. **1950.** table, large fold. plate. **DGS**—Curve shows aggregate rainfall 1883–1949 as excess or deficiency from average of 28.20 inches per annum and other averages. *Subject Headings:* **Precipitation variations, Thames Basin.**

2.2–118 551.577.37

Kaufmann, Hans, **Intensität von Gewitterregen. Hydrometeorologische Untersuchungen unter Anwendung der Kollektivmasslehre und Korrelationsrechnung.** [Intensity of thunder rains. Hydrometeorological investigation with application of frequency methods and correlation.] *Meteorologische Rundschau*, 3(9–10):213–217, Sept.–Oct. **1950.** 5 figs., 3 tables, ref., equations. **DWB, MH-BH**—Summary of an investigation into regional distribution of intense thunder rains in Saxony (91 stations), for which warnings were issued. Intensity increases with height. Relation of mean intensity to duration compared with various formulas; $I=20/T$ (I mm./hr., T hours) comes out best. Another figure shows annual frequencies. The skew frequency distribution of number of litres per second per hectare is investigated statistically (mean 40.3, mode 20.3). *Subject Headings:* **Precipitation intensity, Precipitation distribution, Saxony, Germany.**—*C.E.P.B.*

2.2–119 551.579:551.577.37

Satakopan, V., **Time-depth-area curves of maximum precipitation for the Damodar area.** *Indian Journal of Meteorology and Geophysics*, 1(3):229–236, July **1950.** 8 figs., 3 refs. **MH-BH**—The author analyzes the maximum daily precipitation which occurred during the most severe recorded storm in the Damodar Catchment. On the basis of these data he constructs time-depth-area curves from which one can read off the maximum depth of precipitation that is likely to occur over areas of any size from 1000 to 40,000 square miles for any time interval between 24 and 72 hours. The limitations of these graphs and their significance, the storm map method in designing flood control reservoirs are discussed. *Subject Headings:* **Rainfall depth duration frequencies, Precipitation intensity, Flood control, Damodar Basin, India.**—*I.L.D.*

2.2–120 551.578.11

Maulard, J., **Mesure de la température de la pluie.** [Measurement of rain temperature.] *Journal Scientifique de la Météorologie*, 2(7):75–81, July–Sept. **1950.** 8 figs. French, English and Spanish summaries p. 75. **MH-BH**—A modification of the apparatus used by Byers, Moses and Harney at Wilmington, Ohio (*Journal of Meteorology* 6(1):51, 1949) has been used for the precise determination of the temperature of raindrops at the beginning, during and at the end of a thunderstorm or frontal rainstorm. The construction, testing and use of the thermoelements and the recording circuits are described in detail and illustrated. Sample records for various types of storms are shown. *Subject Heading:* **Rain temperature measurements.**—*M.R.*

SNOW

2.2–121 551.578.4:551.509.3

§Brooks, Charles F. and Schell, Irving I., **Forecasting heavy snowstorms at Blue Hill (Boston), Mass. I. Tracks of the cyclones producing heavy snows in the winters of 1938/9 to 1946/7.** *American Meteorological Society, Bulletin*, 31(4):131–133, April **1950.** 2 figs., table, 4 refs. **Heavy snowstorms at Blue Hill (Boston), Mass. II. Pressure, wind and temperature on Mt. Washington during the 24 hours prior to the onset of heavy snow at Blue Hill.** *Ibid*, 31(5):163–167, May 1950. 5 charts. Schell, Irving I., **Heavy snowstorms at Blue Hill (Boston), Mass. III. Precipitation index at Washington, D. C., and Buffalo, N. Y.,**

associated with heavy winter snowstorms at Blue Hill. *Ibid.*, 31(6):219–221, June **1950.** 2 tables, 2 refs. **DWB**—Pt. I consists of a brief discussion of the peculiarities of the principal snowstorms affecting Blue Hill between 1938 and 1947. Data for the 16 storms yielding 9 to 20 inches of snow in 17 to 54 hours are tabulated. Two charts show cyclone tracks associated with these storms: 7 without secondaries on one chart and 9 with secondaries on the other. In both cases the "guilty" cyclone or secondary formed south of 40° and moved northeastward just 1° to 4° southeast of the coast of New England. The primaries associated with the 9 secondaries were all moving northeast in the Mississippi or Ohio valley. Pt. II consists of a study of pressure, temperature and wind changes on Mt. Washington during the 24 hours preceding the heavy snowstorms at Blue Hill. Pt. III comprises a test of local precipitation indexes w/1 at Washington, D. C. and Buffalo as objective criteria for subsequent heavy snowstorms at Blue Hill. Results of tests for 9 snowstorms tabulated, indicating 36 successful forecasts out of 43 attempts. *Subject Headings:* **Snowstorms, Snow forecasting, Blue Hill Observatory, Massachusetts, New England.**—*M.R.*

2.2–122 551.578.46:551.501

Bader, Henri, **Note on the liquid water content of wet snow.** *Journal of Glaciology*, 1(8):466–467, Oct. **1950. GB-MO**—A method of measuring water content by depression of temperature on melting by sodium hydroxide is described and formulas given. *Subject Headings:* **Snow cover, Water content of snow.**

2.2–123 551.578.43(43)

*Greim, Georg, **Der Schneefall in Hessen in den Jahren 1901–1930.** [Snowfall in Hesse in 1901–1930.] *Germany, Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 5(8), **1938.** 26 p. 7 figs., 12 tables, 10 refs. **DLC**—In this comprehensive survey of the snowfall of Hesse the following topics are covered: number of years in which snow fell during a given month; amount of snowfall; number of days with snowfall; mean density of snowfall; properties of snow in the total precipitation; annual variation in snowfall. The author discusses the evaluation of the data and the rationale of his method. Extensive tables containing the data upon which this study is based are appended. *Subject Headings:* **Snow distribution, Hesse, Germany**—*I.L.D.*

2.2–124 551.578.46:551.311.128

†*Bucher, Edwin, **Beitrag zu den theoretischen Grundlagen des Lawinenverbaus.** [Contribution on the theoretical basis of avalanche defense structures.] Bern, Kümmerly & Frey, **1948.** 113 p. 67 figs., tables, 236 refs., 86 equations. German, French and English summaries. (*Beitrage zur Geologie der Schweiz, Geotechnische Serie, Hydrologie*, 6. Lfg. Herausgegeben von der Geotechnischen Kommission der Schweizerischen Naturforschenden Gesellschaft gemeinsam mit der Schweizerischen Schnee- und Lawinenforschungskommission.) **DWB**—A comprehensive theoretical study of the process of avalanche formation, based upon experimental investigation of the properties of snow, empirical observations of avalanches and of avalanche defense structures. The discussion covers the following topics: physical properties of different types of snow, elastic and plastic deformation of snow and calculation of relaxation time of snow, causes of plastic behavior of snow, contraction and its influence upon plasticity coefficients, viscosity of snow; development of snow cover, relationship between distribution of tension and creep within a snow cover, sliding of natural snow cover over an oblique plane, creep damage; formation of avalanches, theoretical possibilities of primary fracture, influence of temperature on avalanche formation; the properties and effectiveness of defensive structures against avalanches; calculation of the pressure exerted upon skeleton structures by the snow cover. A very complete bibliography is appended. *Subject Headings:* **Avalanche formation, Avalanche protection, Snow cover.**—*I.L.D.*

2.2–125 551.578.4:551.524:551.311.12

Glaister, R. M., **Avalanche of the Glacier du Tour.** *Weather*, 5(4):138–139, April **1950.** 2 plates, 2 tables. **MH-BH**—Four excellent photographs of a glacier and moraine in the Haute Savoie, taken before, during and after a tremendous avalanche (resulting from the breaking off of the end of the glacier). Nine lives were lost, making it the most disastrous in

the French Alps since 1892. *Subject Headings:* **Temperature variations, Avalanches, France.** —*M.R.*

2.2–126 551.579

Lütschg-Loetscher, O., Bohner, Rudolf, Huber, Paul et al., **Zum Wasserhaushalt des Schweizer Hochgebirges, Band I, Teil I, II, Kap. 6–9.** [The water economy of the Swiss Alps, Vol. I, Nos. I, II, Chap. 6–9.] Zurich, Kümmerly & Frey, **1949, 1950.** No. I, p. 103–171. fig. (inc. photos), numerous tables and refs. No. II, p. 1–121. 26 figs., 34 tables (inc. 6 fold.), numerous refs. (*Beitrage zur Geologie der Schweiz, Geotechnische Serie, Hydrologie,* 4. Lfg. Herausgegeben von der Schweizerischen Geotechnischen Kommission, Organ der Schweizerischen Naturforschenden Gesellschaft.—Arbeit aus dem ehemaligen Institut für Gewässerkunde der Eidgenössischen Technischen Hochschule in Zürich) **DWB**—Pt. I begins with a general discussion of the characteristics of the soil and vegetation of high mountain areas and the relationships among precipitation, water utilization by plants, infiltration and evaporation as manifested in the water economy. The subsequent chapters are as follows: vegetation and soils in the water economy of the upper soil layer of the catchment area of Baye de Montreux; significance of snow transport by wind in the water economy of the Swiss Alps; significance of fog clouds and rime formation in the water economy of high mountains.

Pt. II deals with the hydrology, chemistry and geology of winter glacier drainage of the Swiss Alps. The author discusses the drainage of glaciers and surveys the history of studies on glacial streams and g acial drainage in the 19th century. The following topics are then treated: subglacial paths of glacial streams, temperature of glacial streams and the annual relationship between water and air temperatures; chemical properties of glacial streams, the relationship between thaw water and ground water during winter glacial streams and the relationship between mineral content of winter waters of glaciers and the composition of rocks. *Subject Headings:* **Hydrologic cycle, Alps, Switzerland.**—*I.L.D.*

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY

2.2–127 551.58:551.501.45

Chubukov, L. A., **Novoe v uchenii o klimate.** [New methods in the science of climatology.] Moscow, Izda-vo "Pravda," **1949.** 24 p. 5 figs., 15 refs. **DLC**—A pamphlet comprising the material used in a public lecture given by the author in Moscow, with diagrams and charts illustrating the methods described. Since 1920, when E. E. Federov suggested expressing climate as a summation of weather elements or types, the development of such a quantitative system has progressed. Today, if mechanized tabulators and punch cards were available, very complex climatological studies could be made. An example of the cards which are used to compile the complex characteristic of each day's weather at a place, is shown. This characteristic is composed of indexes for temperature, humidity, precipitation, wind, cloudiness and soil conditions. Then these cards are divided into 15 classes (seven for summer, six for winter and two for transition periods) and the character of the climate described or shown graphically by the proportional frequency of each type for each month. In addition frequencies of air masses and fronts must be considered. *Subject Headings:* **Climatology, Statistical methods.**—*M.R.*

2.2–128 551.582:551.589(57)

Chubukov, L. A., **Kompleksno-dinamiko-klimatologicheskiĭ analiz.** [Complex dynamic climatological analysis.] *Problemy Fizicheskoĭ Geografii,* 13:29–45, **1948.** 6 figs., 8 refs. **DLC**—The author analyzes the concepts of weather and climate and the processes of weather formation, and concludes that climate can be described by the aggregate of weather and weather processes manifested over many years and by the frequency of recurrence of weather types. Complex climatology describes climate by beginning with a description of daily weather types, establishing a catalogue of weather types and determining their mean frequency. A specific application of this method is presented. Complex dynamic climatology provides a genetic analysis of climate. It is a combination of the method of complex climatology with synoptic analysis which involves data on air masses and fronts. The author gives

an example of the application of complex dynamic climatologic analysis to the climate of eastern Kazakhstan. *Subject Headings:* **Climatology, Synoptic climatology, Kazakhstan, U.S.S.R.**—*I.L.D.*

2.2–129 551.582(87)

*Gonzales P., Epifanio, **Datos detallados de climatología de Venezuela.** [Detailed data of the climate of Venezuela.] Caracas, Ministerio de Sanidad y Asistencia Social, Dec. **1948.** 639 p. (chiefly tables). graphs. (*División de Malariología, Publicaciones*, No. 8) **MH-BH**—Detailed monthly and annual data for entire period of record for temperature, evaporation, relative humidity, rainfall, wind direction and velocity, from some 300 stations or locations in Venezuela. There is a complete precipitation record for Caracas from 1891–1946, inclusive. Relations between the annual march of certain elements at several stations, are shown graphically. *Subject Headings:* **Climatology, Venezuela.**—*M.R.*

2.2–130 551.582:72

Burgess, C. R., **Local variations of climate.** *Weather*, 5(11):372–373, Nov. **1950. DWB**—Report of lecture by Gordon Manley on "Microclimatology" at Royal Institution of British Architects, and subsequent discussion. *Subject Headings:* **Microclimatology, Urban climatology, Architecture.**

2.2–131 551.582(43)

*Sauer, Waldemar, **Ueber Singularitäten im Witterungsverlaufe von Leipzig.** [Singularities in the weather sequence at Leipzig.] *Germany, Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 5(9), **1938.** 40 p. 14 figs., 26 tables, 13 refs., equation. **DLC**—A study of weather singularities at Leipzig based upon a 30 year mean of mean daily temperatures, of mean barometric pressure at 1400 o'clock, of mean wind velocity and wind direction and of precipitation. By curve smoothing, a collective theoretical value of temperature was obtained which could be compared with the mean daily temperatures of individual years. Method of establishing a criterion for the reality of temperature singularities is set forth and the procedures of Schmauss and Riedel for determining singularities are discussed. It was found that temperature and wind direction which were causally related did not appear as singular elements on certain dates; also precipitation and pressure were not singular. Relationship of singularities to large scale atmospheric motions is discussed and dates on which singularities are most frequent are tested. *Subject Headings:* **Singularities, Climatology, Leipzig.**—*I.L.D.*

2.2–132 551.582(47)

*Fedorov, E. E., **Tipy pogody v ikh povtoriaemostiakh dlia maia, iiulia, noiabria i ianvaria nekotorykh mest Kol'skogo poluostrova.** [Weather types and their frequencies for May, July, November and January for some places on the Kola Peninsula.] *Akademiia Nauk, SSSR, Geomorfologicheskiĭ Institut, Trudy*, No. 5, **1932.** 73 p. tables, refs. English summary p. 71–73. **DLC**—Based on analytical data for 1922–1928 (wind, temperature, cloudiness, humidity, etc.); integrated to form a classification of weather types. *Subject Headings:* **Climatology, Kola Peninsula, Arctic, U.S.S.R.**—*M.R.*

2.2–133 551.582(469)

*Ferreira, H. Amorim, **O clima da Praia da Rocha.** [Climate of Praia da Rocha (Cape Roca).] Observatório do Infante D. Luiz, Lisbon, **1942.** 18 p. tables. **MH-BH**—Monthly and annual means and frequencies of occurrence of various weather elements observed at Praia da Rocha (1915–1940) are presented, analyzed, discussed and compared with similar data for Lisbon. History of station and exposure of instruments given in detail. *Subject Headings:* **Climatology, Cape Roca, Portugal.**—*M.R.*

2.2–134 551.582(491)

Gordon, A. H., **No depression in Iceland.** *Marine Observer*, 20(150):227–228, Oct. **1950. MH-BH**—Brief popular account of climate of Iceland. *Subject Headings:* **Climatology, Iceland.**

CLIMATIC CHANGES

2.2–135 551.583:57(54)

Hora, Sunder Lal, Banerji, S. K. and others, **Satpura Hypothesis of the distribution of the Malayan fauna and flora to peninsular India.** *National Institute of Sciences of India, Proceedings*, 15(18):307–422, Nov.–Dec. **1949. DLC**—A symposium of 20 articles by various specialists on the numerous aspects of this intriguing theory concerning the spread of living organisms from the East Indies to India. Most of the articles touch on the subject of present or past climates and climatic changes in southeast Asia. The introductory article by HORA outlines the contingencies, namely: (1) continuity of the Vindhya-Satpura ranges with the Assam Himalayas in the east and the western Ghats in the west; (2) five or six thousand foot elevation of these ranges; (3) continuity of an ecological belt of mountains with rainfall of >100 inches per year; and (4) dispersal of fauna from east to west and incidental topographical changes. Other articles of importance are:

Auden, J. B.: **A geological discussion on the Satpura Hypothesis and Garo-Rajmahal Gap,** p. 315–340. (Good bibliography).
Banerji, S. K.: **Precipitation on mountain slopes,** p. 353–355.
Banerji, S. K.: **Climate of India in relation to the rainfall distribution,** p. 357–359.
Hora, Sunder Lal: **Climates as affecting the Satpura Hypothesis,** p. 361–364.

The article by AUDEN takes up climatic conditions in the Pleistocene Ice Age, including evaporation losses, runoff and calculations of the hydrologic cycle (3 tables). In the first article by BANERJI, the maximum rainfall on the Satpura range is calculated by Pockel's (1901) formula. It was found that this 3600 ft. range would have to be raised to 8000 feet to get the 200 inches of rain per annum found over the Western Ghats. The second BANERJI article presents a map showing isohyets of annual rainfall with varying shading for conditions as they would have been in the Pleistocene. Brief discussion. The article by HORA (page 361–364) contains data for 17 stations along the Satpura track, similarities in climate are noted, the characteristics of various tracks discussed and the effect of glaciation and climatic change noted. Presence of birds and animals could be accounted for without the ranges having been raised, but certain fish require the existence of conditions such as this hypothesis formulates. *Subject Headings:* **Climatic changes, Orographic effects, Symposia, Satpura Hypothesis, India.**—*M.R.*

2.2–136 551.583.3:523.72

Hoyle, F. and Lyttleton, R. A., **Variations in solar radiation and the cause of ice ages.** *Journal of Glaciology*, 1(8):453–455, Oct. **1950. GB-MO**—At irregular intervals the sun passes through interstellar hydrogen clouds and an increased amount of material falls to the surface with high velocity. Conversion of kinetic energy results in increased solar radiation, up to 10%, mainly in the shorter wavelengths. *Subject Headings:* **Climatic changes, Solar radiation, Glaciation.**

2.2–137 551.583.3

von Klebelsberg, R., **Die eiszeitliche Vergletscherung des Nordwest-Himalaya nach G. Dainelli und H. de Terra—T. T. Paterson.** [Glaciation of northwestern Himalaya during the glacial period according to G. Dainelli and H. de Terra—T. T. Paterson.] *Zeitschrift für Gletscherkunde und Glazialgeologie*, Innsbruck, 1(1):118–138, **1949.** fig. **MH-BH**—Review and discussion of G. DAINELLI, **Studi sul glaciale,** in: *Spedizione Italiana de Filippi nell'Himalaia, Caracorum e Turchestan Cinese* 1913/14, *Resultati geologici e geografici, Ser. 2*, Band 3, 1922 and: H. DE TERRA and T. T. PATERSON, **Studies on the ice age in India and associated human cultures,** *Carnegie Institution of Washington, Publication* No. 493, 1939. Both memoirs give a series of glacial and interglacial periods similar to that of the Alps. Nine other works are brought into consideration. *Subject Headings:* **Climatic changes, Glacial periods, India.**—*C.E.P.B.*

2.2–138 551.583.3

†Gams, H., **Die Alleröd-Schwankung im Spätglazial.** [The Alleröd oscillation in the Late Glacial.] *Zeitschrift für Gletscherkunde und Glazialgeologie*, Innsbruck, 1(2):162–171, **1950.**

fig., biblio. p. 168–171. **MH-BH**—A summary of the literature. This relatively warm period between two glacial advances was synchronous over all northwestern Europe and northern Alps. It began about 8700 B.C. Fauna (a mixture of north Alpine forest and steppe) and flora described. Although shorter and moister than preceding Laufen Oscillation and much shorter and cooler than the Climatic Optimum it was an important episode in life history of Europe. *Subject Headings:* **Climatic changes, Glacial periods, Europe.**—*C.E.P.B.*

2.2–139 551.583.3:551.311.1:016

†von Klebelsberg, R., **Bibliographie.** [Bibliography (of glaciology and glacial geology).] *Zeitschrift für Gletscherkunde und Glazialgeologie*, Innsbruck, 1(2):240–365, **1950.** **MH-BH**—This comprehensive bibliography is a continuation of that published in the *Zeitschrift für Gletscherkunde*, 27:379–463, 1940/41. Most of the entries date from 1940–1949. It is divided into 2 main parts, material and regional; with a small section "personal." The first part deals with snow and firn, avalanches, all forms of ice, glaciers and glaciation, glacial climatic oscillations, morphology, deposits, loess, glaciers and life, all the aspects of ice ages, post-glacial plant fossils and pollen analysis, oscillations of sea level and effect of radiation on glaciers. Many of the entries include short abstracts in German. *Subject Headings:* **Glaciology, Climatic changes, Bibliographies.**—*C.E.P.B.*

2.2–140 551.583.3:551.311.12(234.3)

Morawetz, Sieghard, **Die postglaziale Wärmezeit und die Vergletscherung der zentralen Ostalpen.** [The postglacial warm period and the glaciation of the central eastern Alps.] *Zeitschrift für Gletscherkunde und Glazialgeologie*, Innsbruck, 1(1):63–69, **1949.** 10 refs. **MH-BH**—Assuming that the snow line in climatic optimum lay 500 m. higher than now, author investigates conditions in eastern Alps. Estimates of present snow line vary from 2700 m. (Brückner) to 2950 m. (1930–34). A snow line at 3200 m. would result in a great diminution of glaciers. *Subject Headings:* **Climatic changes, Glaciation, Alps.**—*C.E.P.B.*

2.2–141 551.583.7:523.7

Öpik, E. J., **Secular changes of stellar structure and the ice ages.** *Royal Astronomical Society, Monthly Notices*, 110(1):49–68, **1950.** 3 figs., 5 tables. Summary p. 49. **DNO**—Author calculates that a suddenly initiated convective mixing in the central part of the sun may spread to outer regions, causing a drop in luminosity. The complex decay of this disturbance would occupy about 5×10^6 years, during which sun's radiation would be markedly decreased. He considers this process to be the cause of ice ages; the various glaciations within an ice age being attributed to complications in the outer layers of the sun. *Subject Headings:* **Climatic changes, Paleoclimates, Solar influences.**

MICROCLIMATOLOGY

2.2–142 551.584.5:551.524.2

Sundborg, A., **Local climatological studies of the temperature conditions in an urban area.** *Tellus*, 2(3):222–232, Aug. **1950.** 11 figs., 7 refs., 8 equations. **DWB**—A preliminary report on a comprehensive investigation of the local variations in the climate and weather condition affecting temperature in and around Uppsala. Methods of observation and selection of stations stressed, anomalies produced by built-up or vegetated areas considered. Isotherm maps and cross sections (vertical profiles) based on brief records, presented. Long period variations show evidence of a decrease in amplitude of daily temperatures. *Subject Headings:* **Local climatology, Urban climatology, Temperature variation, Uppsala, Sweden.**—*M.R.*

CLIMATIC CLASSIFICATION

2.2–143 551.585(469)

*Ferreira, H. Amorim, **O "clima português" de Martonne e a classificação de Köppen.** [Portuguese climate according to de Martonne and the classification of Köppen.] *Ordem dos Engenheiros, Boletim*, Lisbon, 6(68):283–288, Aug. **1942.** 2 tables. **MH-BH**—Mean monthly values of temperature and precipitation (1901–1930) are given for 23 stations in

Portugal and neighboring island possessions, and the data examined in the light of various systems of climatic classification (KÖPPEN, DE MARTONNE, THORNTHWAITE, etc.). The author then attempts to assign designators to the various climatic regions of Portugal. *Subject Headings:* **Climatology, Climatic classification, Portugal.**—*M.R.*

2.2–144 551.585:581.5(492)

Veen, B., **Klimatologische indelingen toegepast op Nederland.** Price F. 2.9. [Climatological systems applied to the Netherlands.] *Wageningen [Netherlands], Landbouwhoogeschool tijdschrift, Mededelingen*, **1949.** 7 figs., 27 charts, 20 tables, refs. English summary p. 212. **DLC**—Review of different systems of climatic classification by MAYR, KÖPPEN, CAJANDER, RUBNER, LANG, DE MARTONNE, THORNTHWAITE, MAYER and OELKERS, with application to data for the Netherlands. Advantages of each system cited. *Subject Headings:* **Climatic classification, Netherlands.**—*M.R.*

BIOCLIMATOLOGY

2.2–145 551.586:63(43)

†*Nuttonson, Michael Y., **Ecological crop geography of Germany and its agro-climatic analogues in North America.** Washington, D. C., *International Agro-climatological Ser.*, No. 8, **1949.** 36 p. map, fold. chart, 7 tables, 21 refs. **MH-BH**—The geography, climate, forests and soils of Germany are described. Data on mean monthly temperature, relative humidity and precipitation, on absolute temperature, on average killing frost dates, duration of average frostless season and on precipitation effectivity indices are presented for 310 German meteorological stations. A list of climatically analogous North American meteorological stations and their locations are given in agro-climatic charts. *Subject Headings:* **Ecoclimatology, Agricultural climatology, Germany.**—*I.L.D.*

2.2–146 551.586:63

Nuttonson, Michael Y., **USSR: Some physical and agricultural characteristics of the drought area and its climatic analogues in the United States.** *Land Economics*, 25(4):346–351, Nov. **1949. DWB**—*Subject Headings:* **Agricultural climatology, Drought areas, U.S.S.R.**

2.2–147 551.586:63

†Prytz, Knud Steenstrup, **Landbrugsmeteorologiske korrelationsundersøgelser.** [Agricultural meteorological correlation studies.] Copenhagen, Akademiet for de Tekniske Videnskaber og Dansk Ingeniørforening. Copenhagen, G.E.C.Gad, [**1948**]. 127 p. fig., tables, 45 refs., numerous equations. English summary p. 121–124. (*Ingeniørvidenskabelige Skrifter* Nr. 4, 1948) **DLC**—This monograph is concerned with the validity of using regression equations for prediction (for example the determination of the size of July harvests on the basis of climatic data for June) and for proving causal relationships among phenomena. The author discusses the meaning of correlation and of regression lines, their calculation and their statistical reliability. Specific examples of various types of regression equations are presented: regression equations based upon known causes, such as soil temperature in a potato field as a function of incoming and outgoing radiation; regression lines describing certain assumptions; interpretation of regression lines with "quasi-causes." A regression equation for predicting harvest is analyzed. All the examples are based upon agricultural and meteorological data. *Subject Headings*: **Agricultural meteorology, Statistical studies.**—*I.L.D.*

2.2–148 551.54:551.586:612

Fedorov, N. T. and Fedorova, V. E., **Ob izmeneniiakh tsvetnogo zreniia na El'bruse.** [On change in color vision on Mount Elbrus.] (In **Trudy El'brusskoĭ Ekspeditsii Akademii Nauk, SSSR, i Vsesoiuznogo Instituta Eksperimental'noĭ Meditsiny 1934 i 1935.** [Reports of the Elbrus Expedition 1934 and 1935.] Moscow, **1936.** p. 441–446. 5 figs. English summary p. 446. [*Ak. Nauk, SSSR, Komissiia po izucheniiu stratosfery*, Tom II]) **DLC**—Changes in color vision were investigated by means of anomaloscope of the Maxwell disc type and a device for determining a scarcely perceptible admixture of color on an achromatic

background of uniform brilliance. At high elevations the sensitivity to green and blue is reduced more than the sensitivity to red and yellow. *Subject Headings:* **Physiological climatology, Color vision, Atmospheric pressure, Elbrus Expedition, U.S.S.R.**—*I.L.D.*

2.2–149 551.586:612

Serafimov, B. N., **Gornaia bolezn'.** [Mountain sickness.] (In **Trudy El'brusskoĭ Ekspeditsii Akademii Nauk, SSSR, i Vsesoiuznogo Instituta Eksperimental'noĭ Meditsiny 1934 i 1935.** [Reports of the Elbrus Expedition 1934 and 1935.] Moscow, **1936.** p. 313–319. Summary in English p. 319. [*Ak. Nauk, SSSR, Komissiia po izucheniiu stratosfery*, Tom II]) **DLC**—The author describes the cause and symptoms of mountain sickness and attempts to account for its etiology. *Subject Headings:* **Physiological climatology, Atmospheric pressure, Mountain sickness, Elbrus Expedition, U.S.S.R.**—*I.L.D.*

2.2–150 551.586:616

Réthly, Endre, **Beziehungen der ansteckenden Krankheiten zur Witterung mit besonderer Berücksichtigung der HEINE-MEDINschen Epidemien in Ungarn in den Jahren 1931–1947.** [Relations of infectious diseases to weather with special reference to meningitis epidemics in Hungary 1931–1947.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 2(3):279–290, **1950.** 3 tables, 13 refs. German, English and French summaries p. 279–280. **DWB**—Previous works on effect of weather on poliomyelitis and other infections are summarized. Author then tabulates frequencies of polio in Hungary by months and temperature and rainfall of peak months. He finds no connection except a slight bias towards dry months; there is possibly a double wave in sunspot cycle. Polio is most frequent in cool, rainy north and northeast Hungary. *Subject Headings:* **Bioclimatology, Infectious diseases.**—*C.E.P.B.*

UPPER AIR CLIMATOLOGY

2.2–151 551.587(269)

Loewe, F. and Radok, U., **Some amendments to "A meridional aerological cross section in the Southwest Pacific."** *Journal of Meteorology*, 7(4):305–306, Aug. **1950.** table, 2 refs. **MH-BH**—Revision of charts in author's article (*Journal of Meteorology*, Feb. 1950, *see item* 5–101, *Meteorological Abstracts and Bibliography*, 1(5), May 1950) based on 2 years of radiosonde data from Macquarie Island, and results of 35 flights made during the French Antarctic Expedition to Adélie Land, plus a summer's flights made at Hobart, Tasmania showing higher tropopause in winter than in summer at Macquarie Island. New temperature and height averages are presented. *Subject Headings:* **Upper air climatology, Southwest Pacific, Antarctic.**—*M.R.*

MISCELLANEOUS APPLICATIONS

VISIBILITY

2.2–152 551.591:551.593.5

Coleman, Howard S. and Rosenberger, Harold E., **Spectral dependence of the attenuation of brightness contrast by the atmosphere.** *Journal of Meteorology*, 7(4):259–262, Aug. **1950.** 7 figs., table, 6 refs., 6 equations. **MH-BH**—The effect of wave length on the attenuation of brightness contrast by the atmosphere was studied by means of apparatus and procedure based upon a law derived by KOSCHMIEDER. The attenuation coefficient was expressed in terms of meteorological range and measurements were made by means of which the dependence of meteorological range upon wave length was found to be a linear rather than a fourth power function, and the linear relationship was valid for white and black objects over a wide range of atmospheric transparencies. It is concluded that molecular scattering is not the predominant factor in the atmospheric attenuation of brightness contrast. *Subject Headings:* **Visibility, Scattering.**—*I.L.D.*

2.2–153 551.591(54)

Mukherjee, S. M. and Karve, C. S., **Visibility at the Colaba Observatory, Bombay.** *Indian Journal of Meteorology and Geophysics*, 1(3):220–228, July **1950.** 5 figs., 3 tables, ref. **MH-BH**—Visibility measurements were made at the Colaba Observatory, Bombay, from an

elevation of 50 feet by means of the Bennet and Wigand meters. The observations were made at specified hours between sunrise and sunset and at night. The authors discuss the relation between Wigand and Bennet meter disc numbers and the International Code Figures for Visibility, special characteristics of visibility at Bombay, monthly variations in visibility, hourly variations in visibility on selected days and nights, and the relationship between wind direction and visibility. *Subject Headings:* **Visibility, Bombay, India.**—*I.L.D.*

2.2–154 551.591.1:551.508.92

†Foitzik, Leonhard, **Über die Lichtdurchlässigkeit der stark getrübten Atmosphäre im sichtbaren Spektralbereich.** [Transmission of light in the visible spectrum through a very turbid atmosphere.] *Germany, Reichsamt für Wetterdienst, Wissenschaftliche Abhandlungen*, 4(5), **1938.** 31+p. 31 figs., 8 tables, 40 refs., 35 equations, append. **DLC**—The transmissibility of a very turbid atmosphere to light of varying wave length was investigated with a Koschmieder-Zeiss night visibility meter. Effect of scattered light upon visibility measurements is analyzed theoretically and a relationship is established between scattered and direct light. The theoretical principles underlying the apparatus, its calibration and operation are discussed. Visibility measurements were made with red, yellow, green and blue filters; influences of normal and abnormal turbidity and dependence of extinction coefficient upon wave length are analyzed. Influence of meteorological factors, such as climate of locality of observations, atmospheric particles and wind direction upon turbidity properties of atmosphere are considered. The experimental measurements are compared with the theoretical work of STRATTON and HOUGHTON on water clouds. The range of colored lights at night is calculated and tables for varying turbidity conditions and light intensities are given. There is appended a theoretical discussion of the visibility of large objects. *Subject Heading:* **Visibility measurements.**—*I.L.D.*

IRIDESCENT CLOUDS

2.2–155 551.593.652

†Dieterichs, Heinz, **Über die Entstehung der Perlmutterwolken.** [On the origin of mother-of-pearl clouds.] *Meteorologische Rundschau*, 3(9–10):208–213, Sept.–Oct. **1950.** 8 figs., 53 refs. German and English summaries p. 208. **DWB, MH-BH**—Surface pressure distributions and tracks of depressions (indicating upper winds) are plotted for occasions of mother-of-pearl clouds. A close connection is found with weather type (S. Norway N.W., N; British Isles Wly.; N. Scandinavia N. of W.). The clouds are attributed to condensation in a cold stratosphere due to vertical waves in the lee of mountains. Observations in India and Alaska are also mentioned. (This paper is a more detailed presentation of the article by same author which was abstracted as *item* 9–152, *Meteorological Abstracts and Bibliography*, 1(9), Sept. 1950.) *Subject Heading:* **Nacreous clouds.**—*C.E.P.B.*

2.2–156 551.593.653

Noctilucent clouds on night of June 30–July 1, 1950. *Meteorological Magazine, London*, 79(940):301, Oct. **1950. MH-BH**—Observed from SE England; estimated position north Scotland. *Subject Headings:* **Noctilucent clouds, Great Britain.**

ATMOSPHERIC ELECTRICITY

2.2–157 551.594

Israël, Hans, **Zur Entwicklung der luftelektrischen Grundanschauungen.** [On the development of views of atmospheric electricity.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(1–2):1–16, **1950.** 14 figs., 21 refs., 3 equations. German, English and French summaries p. 1–2. **DWB**—Author deals first with theories of atmospheric electricity from the 18th Century until the discovery of ionization brought the idea of equilibrium between the negative fine weather current and the transport of positive charges in thunderstorms. Most of the paper discusses the origin of three types of diurnal variation: double and single oscillations related to local time and the world time oceanic type. Vertical current depends on potential difference, columnar resistance and length of path, and diurnal variations of these over continents and oceans are discussed on the basis of variations in depth of air

exchange. The annual change in the type of diurnal variation is due to variation of this depth and of suspended particles. *Subject Heading:* **Atmospheric electricity.**—*C.E.P.B.*

2.2–158 551.594.11:551.510.42:551.21

Hatakeyama, H., **On the disturbance of the atmospheric potential gradient caused by the smoke-cloud of the volcano Yake-yama.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 27(12):372–376, Dec. 1949. 2 figs., 5 refs. In Japanese, English summary p. 39–40. **MH-BH**—Following an eruption on Feb. 5, 1949, electrometer at Kakioka recorded a large "bag" [?bay] type disturbance exceeding −1200 v./m. Taking height of cloud as 4 km., author calculated variation of potential gradient from 10 h. 40 m. to 12 h. 20 m., which agreed closely with observation. *Subject Headings:* **Potential gradient, Volcanic dust, Japan.**—*C.E.P.B.*

2.2–159 551.594.11

Kasemir, H. W., **Studien über das atmosphärische Potentialgefälle IV. Zur Strömungstheorie des luftelektrischen Feldes I.** [Studies on atmospheric potential gradient IV. On the flow theory of the atmospheric electric field I.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(1–2):84–97, 1950. 4 figs., 3 refs., 26 equations. German, English and French summaries p. 84–86. **DWB**—A mathematical discussion of the earth's electric field, starting from BENNDORF and MAXWELL. Author first sets out the flow in a spherical condenser, giving a diagrammatic representation of the space charge. This is applied to clouds without precipitation and to thunder clouds. He concludes that space charges, which play the leading part in electrostatic theories, have practically no influence on the current density or field strength. This leads to a new conception of potential gradient at sea and on high mountain peaks and shows that the daily variation is determined partly by the variable air resistance over continents and only partly by world thunderstorm activity. *Subject Heading:* **Potential gradient.**—*C.E.P.B.*

2.2–160 551.594.12

†Norinder, Harald and Siksna, Reinhards, **Variations in the density of small-ions caused by the accumulation of emanation exhaled from the soil.** *Tellus*, 2(3):168–172, Aug. 1950. 8 figs., 14 refs. **DWB**—During calm summer nights atmospheric stability favors accumulation of radioactive emanations from the soil, as indicated by records of high ion density. During the daytime and when convection is active, these emanations are spread through the whole atmosphere, with a corresponding accumulation of a very small fraction of the amount formed on calm nights. Variations with other elements shown graphically. *Subject Headings:* **Ionization, Radioactive emanations.**—*M.R.*

2.2–161 551.594.12:551.584

Norinder, Harald and Siksna, Reinhards, **Variationen des Ionengehaltes in der bodennahen Luftschicht.** [Variations of the ion content in the layer of air near the ground.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(1–2):29–39, 1950. 7 figs., 12 refs. German, English and French summaries p. 29. **DWB**—Describes measurements of ion concentration at the Institute for High Tension Research, Uppsala, Sweden. Curves show variations of light negative, light positive and heavy positive ions during a thunderstorm (marked increases of light ions) and rain shower (all three, especially heavy ions). On a still, clear summer night ion content increased with relative humidity; this is attributed to accumulation of emanation near the ground. Penetration spectra of α-particles into photographic emulsion show origin of emanation. Measurements were also made of nocturnal variation of concentration at different heights from 0.1–2.1 meters showing that the nocturnal increase falls off with height. *Subject Headings:* **Ionization, Micrometeorology, Uppsala, Sweden.**—*C.E.P.B.*

2.2–162 551.594.13

Hogg, A. R., **Air-earth current observations in various localities.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(1–2):40–55, 1950. 2 figs., 7 tables, 12 refs., 3 equations. English and French summaries p. 40–41. **DWB**—Average values of total conductivity

near ground level and air-earth current i are assembled for 18 stations and show approximate relation $i=4.2(\lambda+70)^{0.7}$ which also fits variation of current with conductivity at individual stations. Hence, specific conductivity at a point near ground level is an index of total resistance above that point. The variations of i at different stations from year to year show a tendency to run parallel. The annual variation of air-earth current (mean of 17 stations) shows fair agreement with annual variation of thunderstorms. This supports the thunderstorm theory of maintenance of earth's electric charge. Table 7 summarizes observations at Canberra 1930–1937. *Subject Heading:* **Electrical conductivity.**—*C.E.P.B.*

2.2–163 551.594.14

Hess, V. F., **New studies on the radioactivity of the atmosphere.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(1–2):56–63, **1950.** 3 tables, 6 refs., 6 equations. English and French summaries p. 56–57. **DWB**—The effect of the gamma rays from radioactive substances in the atmosphere near New York was measured in an ionization chamber; it averaged 0.15 I (ion pairs/cm.^{3}/sec.) with considerable day-to-day variations. Alpha rays from radon and its decay products gave 0.93 I and from thoron and its decay products 0.83 I. The radon content averaged 46×10^{-18} curie/cm^3. *Subject Headings:* **Atmospheric radioactivity, New York.**—*C.E.P.B.*

2.2–164 551.594.21

Schonland, B. F. J. and Malan, D. J., **The distribution of electricity in thunderclouds.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(1–2):64–69, **1950.** 2 tables, 7 refs., equation. English, German and French summaries p. 64–65. **DWB**—A large thundercloud consists of a number of separate bipolar generators associated with separate cells forming the cloud. Evidence obtained by Simpson with the alti-electrograph showing that the lower negative poles of these generators are usually at or above the freezing level is supported by three different arguments based upon the study of lightning discharges to earth. It is shown that positive point discharge from the ground may produce isolated pockets of positive charge in the actual base. An outline is given of recent experimental results which throw light upon the manner in which the lower negative poles of these separate generators link up with the channel of the first stroke. *Subject Heading:* **Thunderstorm electricity.**—*Author's abstract.*

2.2–165 551.594.22:551.501.7

Wait, G. R., **Measurements by airplane of electric charge passing vertically through thunderstorms to ground.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(1–2):70–76, **1950.** 3 figs., 2 tables, 11 refs. English, German and French summaries p. 70. **DWB**—A revised electrical balance sheet suggests that insufficient negative charge is returned to ground by thunderstorms to maintain loss in fair weather. To obtain further data, measurements of vertical current density were made by airplane above thunder clouds at 40–50,000 ft. Vertical gradients in v./cm. are shown graphically for various traverses. The direction of the resultant current was always such as to maintain a negative charge over fair weather parts of the earth and of the right order of magnitude (0.6–6 amp., average 1 amp.). The bipolar nature of thunderstorms is supported. Electrical conductivity increased roughly as the square of the altitude. No charge in the conductivity due to a thunderstorm was detected. *Subject Headings:* **Electrical conductivity, Electrical discharges, Upper air observations.**—*C.E.P.B.*

2.2–166 551.594.221:537

Higham, J. B. and Meek, J. M., **Voltage gradients in long gaseous spark channels.** *Physical Society of London, Proceedings, Ser. B*, 63:633–648, **1950.** 3 figs., 4 tables. **The expansion of gaseous spark channels.** *Ibid.*, p. 649–661. 14 figs., 3 tables. **DLC**—These two papers are of interest in the study of lightning discharges. Aperiodic impulse currents rising to peak values of 60–500 or 700 amp. in $\frac{1}{4}\mu$ sec. were used, decaying to $\frac{1}{2}$ value in 10–85μ sec. The sparks traversed air and various gases at atmospheric or lower pressure. Voltage gradients are independent of the peak current but are influenced by current decay. In air at atmospheric pressure they averaged 160 v./cm. $\frac{1}{2}\mu$ sec. after breakdown. The second paper describes experiments with a rotating mirror camera recording expansion of spark channels on a moving film. The cross section of spark channel is linearly related to

peak current. The radial light distribution across spark channels is recorded, the mechanism of expansion discussed and estimates made of ion densities in spark channels. *Subject Headings:* **Disruptive discharges, Lightning.**

2.2–167 551.594.223

Aliverti, G. and Lovera, G., **Über einige in Oberitalien beobachtete Kugelblitze.** [On some ball lightning observed in Upper Italy.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(1–2):77–83, **1950.** 3 refs. German, English and French summaries p. 77. **DWB**—Various theories of the origin of ball lightning are summarized but none explain all phenomena. Six cases observed in Italy are recorded, of which only one was certainly ball lightning. The others may have been residual lightning effects (Toepler's theory). *Subject Headings:* **Ball lightning, Italy.**—*C.E.P.B.*

2.2–168 551.594.25:621.396.11

Randall, A. W., Trout, C. C. and others, **Performance of S-band and L-band surveillance radars during rain and cloud conditions.** *U. S. Civil Aeronautics Administration, Technical Development Report*, No. 92, Indianapolis, Indiana, **1949.** 8 p. 7 figs., table. **DLC**—Tests were conducted and results tabulated to show the ratio of signals received on a PPI scope from aircraft and from rain or clouds. Equipment and observations illustrated. Methods of improving reception described. *Subject Headings:* **Bright band echoes, Radar.**—*M.R.*

RADIO METEOROLOGY

2.2–169 551.594.6:551.509.3

Lugeon, Jean, **L'essor de la radiométéorologie mondiale et la prévision du temps.** [The progress of world radio meteorology and weather forecasting.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(1–2):120–138, **1950.** 2 figs. French, German and English summaries p. 120–121. **DWB**—Author sets out the history of investigations of sferics in synoptic meteorology. The various international organizations concerned and the resolutions passed by them, are listed. Instrumental methods are briefly described; the knowledge obtained and its applications to the study of thunderstorms, radiotelegraphy and forecasting are listed. The organization of a radiometeorological network is set out, with the Argentine as an example. Finally, reference is made to sferics codes. *Subject Headings:* **Sferics, Radiometeorological networks, Weather forecasting.**—*C.E.P.B.*

2.2–170 551.594.7

Fuchs, J., **Die effektive Ausbreitungsgeschwindigkeit kurzer Radiowellen.** [The effective speed of transmission of short radio waves.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 3(1–2):139–152, **1950.** 4 tables, 7 refs., 16 equations. German and French summaries p. 139–140. **DWB**—Various observations of speed of radio waves and light waves are quoted and discussed. From the effective height of the reflecting layer and the angle of incidence, the ratios of the distance between transmitter and receiver to the actual distance travelled, times velocity of light (taken as 299794 km./sec.), the effective speeds are calculated. They are summarized:

Angle of incidence °	30	20	10	0
Effective speed km./hr.	246,000	268,000	281,000	290,500

The last is the speed of transmission round the world. *Subject Headings:* **Radio waves, Radio transmission.**—*C.E.P.B.*

2.2–171 551.594.7

Stranz, Dietrich, **Meteorologie und Mikrowellenausbreitung.** [Meteorology and the extension of microwaves.] *Meteorologische Rundschau*, 3(9–10):199–202, Sept.–Oct. **1950.** 2 figs., 2 tables, 20 refs., equations. **DWB, MH-BH**—After a historical introduction, author applies laws of optics to calculations of paths of radio beams for various refractive indices and degrees of absorption. The dimensions of the factors are of the same order as those of small discontinuities in the troposphere. Finally, a reference is made to "radioclimatology." *Subject Heading:* **Radio meteorology.**—*C.E.P.B.*

2.2–172 551.594.7

Unusual report on radar performance from the T.S.S. Clan Davidson on a voyage from Suez to Aden. *Marine Observer*, 20(150):212–216, Oct. **1950.** 2 figs. **MH-BH**—False echoes recorded on constant bearing 10 to 3 miles in superrefraction, May 7–8, 1949. Notes by HOPKINS and DE PAGE. Explanation obscure. *Subject Headings:* **Radar echoes, Red Sea.**

2.2–173 551.594.71:550.386:551.521.1

Sivaramakrishnan, M. V., **Some geomagnetic disturbances at Alibag Observatory (India) and allied radio and solar effects (1937–1946).** *Indian Journal of Meteorology and Geophysics*, 1(3):207–219, July **1950.** 8 figs., table, 16 refs. **MH-BH**—The phenomena of solar flare and radio fade-out and the ionospheric disturbances associated with four magnetic storms recorded at Alibag Observatory are described in detail, and time of travel of solar corpuscles from sun to earth is considered. (A test of intense solar flares with radio fade-out and sudden pulses in Alibag magnetic traces as counterpart and the associated magnetic storms the next day, for the period 1937–1946 is given). The magnetograms of the individual magnetic storms are compared, the characteristics of the magnetic storms are discussed, the causes of the observed phenomena are indicated and criteria for predicting the occurrence of great magnetic storms are given. *Subject Headings:* **Magnetic disturbances, Anomalous radio propagation, Solar flares, Bombay, India.**—*I.L.D.*

OCEANOGRAPHY AND HYDROGRAPHY

2.2–174 551.46(09)

Shuleĭkin, V. V., **Fizika moria v krugu nauk Stalinskoĭ epokhi.** [Physics of the sea as a part of the science of the Stalin epoch.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geogr. i Geofiz.*, 14(1):7–24, Jan.–Feb. **1950.** 9 figs. **DLC**—A detailed account of research in physical oceanography carried out during the past two or three decades (brief mention is made of earlier investigations), with particular emphasis on the work done at the Chernomorskaia Gidrofizicheskaia Stantsiia (Black Sea Hydrophysical Station). Important problems investigated were: (1) the thermal conditions of the sea, (2) wind effects on shores, (3) storm waves on tides, (4) bottom currents, (5) effects of oil in reducing waves, (6) optical conditions in the sea, (7) acoustics, (8) boundary layer conditions in the atmosphere above the sea. Mention is made of a discovery that "shows the fallibility of *Western Science*," namely: that the color of the sea does not depend on coloring matter in the sea but on the absorption and diffusion of light by the molecules of water and dissolved gases. Finally, it is noted that the Black Sea Geophysical Station, which was demolished during the war, and the Moscow Marine Laboratory are now under the supervision of the Marine Hydrophysical Institute of the Academy of Sciences (Akademii Nauk, SSSR). *Subject Headings:* **Oceanography, Oceanographic research laboratories, U.S.S.R.**—*M.R.*

2.2–175 551.46

Uspenskiĭ, A. P., **K gidrokhimii Aral'skogo moria.** [About the hydrochemistry of the Aral Sea.] *Vsesoiuzonoe Geograficheskoe Obshchestvo, SSSR, Izvestiia*, 82(1):59–64, Jan.–Feb. **1950.** 4 tables, 8 refs. **DLC**—The chemical analysis of Aral Sea water made by K. SHMIDT from samples obtained by JOHN GRIMM on July 6, 1873 is compared with data obtained by the author on July 19, 1945 at the same place (as well as at four other points). The conclusion is that the volume of the Aral Sea has increased, during the last 70 years, and the salinity has decreased. Evaporation and salinity of the Aral Sea is compared with that of the Caspian Sea and Pacific Ocean. Effect of salinity on fish life discussed. *Subject Headings:* **Hydrochemistry, Salinity, Evaporation, Aral Sea, U.S.S.R.**—*M.R.*

2.2–176 551.46:06

Iselin, Columbus, O'D., **Research in oceanography at the Woods Hole Oceanographic Institution during April 1947 to April 1948.** *American Geophysical Union, Transactions*, 29(4):575–577, Aug. **1948. DWB**—*Subject Heading:* **Oceanographic research.**

2.2–177 551.46:06

McEwen, George F. (and Staff), **Research within physical oceanography and submarine geology at the Scripps Institution of Oceanography during April 1947 to April 1948.** *American Geophysical Union, Transactions*, 29(4):578–580, Aug. **1948. DWB**—*Subject Heading:* **Oceanographic research.**

2.2–178 551.46:532.59

Groen P. and Weenink, M. P. H., **Two diagrams for finding breaker characteristics along a straight coast.** *American Geophysical Union, Transactions*, 31(3):398–400, June **1950.** 2 figs., 7 refs., 4 equations. **MH-BH**—The authors describe the method for determining by successive approximation the characteristics of breakers and surf from a knowledge of the bottom topography of the shallow water and from the conditions of sea and swell in the deep waters off a coast. Two diagrams are presented, one for obtaining the breaker height and the other the breaker angle from the initial steepness and the crest angle in deep water. The characteristics of breakers for the case of sufficiently straight and parallel bottom contours can be read directly from these diagrams if the initial steepness and crest angle are known. *Subject Headings:* **Breakers, Nomograms.**—*I.L.D.*

2.2–179 551.461.2

Tucker, M. J., **Surf beats: sea waves of 1 to 5 min. period.** *Royal Society of London, Proceedings, Ser. A*, 202:565–573, **1950.** 8 figs. **DWB**—Autographic records of wave heights at Perranporth, north Cornwall, 1000 yards from beach, showed in addition to ordinary surf, long waves of period 2–3 minutes and a few inches height, with crests about 5 min. after groups of large surf. These are due to mass transport of water by breaking waves, reflected from the beach. An optical meter for determining correlation with different lags is described. *Subject Headings:* **Wave heights, Surf, Cornwall, England.**

2.2–180 551.461.2

†*Polli, Silvio, **Livelli marini eccezionali registrati a Trieste, Grado, Marano, Venezia e Porto Marghera.** [Extreme sea levels registered in Trieste, Grado, Marano, Venice, and in Porto Margher.] *Istituto Talassografico, Publicazioni*, Trieste, No. 247, **1948.** 11 p. 8 tables, 12 refs. **MH-BH**—Cause of exceptional tides ascribed to low atmospheric pressure locally and high pressure on the southern Adriatic and Central Mediterranean; to strong and persistent scirocco winds, as well as to astronomical and seiche influences. Extremes at Trieste since 1875 listed. *Subject Headings:* **Tidal extremes, Adriatic Sea, Trieste, Italy.**—*M.R.*

2.2–181 551.464

*Granqvist, Gunnar, **The increase of the salinity along the coast of Finland since 1940.** *Fennia*, 71(2):1–14, **1949.** 3 figs., 11 tables, 3 refs. **DSI**—Salinities at 20, 50 and 90 m. depth are tabulated for 19 stations for the years 1939–1948 and compared with average for 1921–1930, and the yearly averages at the shore for 1931–1947 compared to 1921–1930. They show a marked increase from 1925–1947. Data for some stations go back to 1905 and curves have been drawn showing variations since that time. No periodicity is found in most station records, but a seeming 25 year periodicity at others. (*See item* 2.2–182 for a similar article by the same author.) *Subject Headings:* **Salinity, Oceanography, Finland.**—*M.R.*

2.2–182 551.464

Granqvist, Gunnar, **Vattnets salthalt utmed Finlands kust under 1940-talet.** [Salinity of water along the coast of Finland in the 1940's.] *Geophysica*, Helsinki, (3);127–137, **1948.** fig., 11 tables. English summary p. 137. **MH-BH**—The mean monthly surface salinity of shore waters corresponds in general to the mean monthly salinity of deeper waters. All observations have been compared with corresponding values for the same stations for the decade 1921–1930 which had been calculated by means of harmonic analysis. As compared with these mean values the salinity during the 1940's was high along the southern coast of Finland, in the northernmost Baltic and in the Gulf of Finland. As to the Gulf of Bothnia,

the study shows how the salt water passed both of the threshold seas and thereafter the salinity became relatively high also along the western coast of Finland. (*See item* 2.2–181 for a similar article in English by the same author.) *Subject Headings:* **Salinity, Oceanography, Finland.**—*I.L.D.*

2.2–183 551.482.215

Binnie, A. M. and Hookings, G. A., **Laboratory experiments on whirlpools.** *Royal Society of London, Proceedings, Ser. A*, 194(1038):398–415, Sept. 2, **1948.** 9 figs., 2 tables, 11 refs., 14 equations. **DWB**—*Subject Headings:* **Whirlpools, Hydrodynamics.**

MICROSEISMS

2.2–184 550.34

Caloi, P., Marcelli, L., and Pannocchia, G., **Sulla velocità di propagazione delle onde superficiali in corrispondenza dell'Atlantico.** [The velocity of propagation of the surface waves in the Atlantic.] *Annali di Geofisica*, 2(3):347–358, July **1949.** 11 figs., table, 4 refs. **MH-BH**—A study of propagation of surface seismic waves across the Atlantic, based on records made on April 24, 1947. Conclusion is that the Atlantic Basin acts as a unit (in contrast to the Pacific) with respect to wave propagation along the bottom of the sea. *Subject Headings:* **Seismology, Atlantic Basin.**—*M.R.*

2.2–185 550.342:551.543

Caloi, Pietro, **Due caratteristici tipi di microsismi.** [Two characteristic types of microseisms.] *Annali di Geofisica*, 3(3):303–314, July **1950.** 7 figs., 5 refs. **MH-BH**—The author presents evidence that microseisms have a dual origin. The microseisms characteristic of the Gulf of Trieste are described and explained by rapid variations of atmospheric pressure accompanying a sudden rise of atmospheric pressure when the center of a moving cyclone is over the open sea near the coast. The microseisms recorded at Catania are cited as an example of microseisms caused by the action of waves upon the coast. *Subject Headings:* **Microseisms, Pressure variations, Wave action, Catania, Italy.**—*I.L.D.*

2.2–186 532.59:550.342

§Darbyshire, J., **Identification of microseismic activity with sea waves.** *Royal Society of London, Proceedings, Ser. A*, 202:439–448, **1950.** 6 figs. **DWB**—Three cases are shown in which a depression over the Atlantic was producing large waves while waves on the coast were small and of different period. Wave records on west coast and microseisms at Kew were submitted to frequency analysis and it was found that each band of microseisms can be identified with a band of sea waves twice its period. Author supports theory that microseisms are produced in a region of interference between similar wave trains travelling in opposite directions. *Subject Headings:* **Wave action, Cyclonic activity, Microseisms, Great Britain.**

2.2–187 550.342:551.509.31(45)

§Giorgi, M. and Rosini, E., **Sulla natura delle cause che generano i microsismi.** [Nature of the factors which cause microseisms.] *Annali di Geofisica*, 3(2):173–213, April **1950.** 13 figs., 16 refs. **MH-BH**—The authors discuss in detail the characteristics of microseisms recorded at Rome during 1947, and the development of the weather situation over the Mediterranean region and the behavior of individual meteorological factors (atmospheric pressure, barometric tendency, direction and force of wind and state of the sea) during the period of recording of the microseisms. They conclude that in the Mediterranean region, microseisms are produced in the open sea by either stationary or moving centers of positive barometric tendency. Microseisms are accompanied by atmospheric disturbances and they maintain their structural character although their amplitude and period vary with variations in the energy and position of the centers of positive barometric tendency. The origin of microseisms is attributed to pressure impulses produced presumably by atmospheric turbulence aloft. *Subject Headings:* **Microseisms, Cyclonic activity, Mediterranean Region, Italy.**—*I.L.D.*

GLACIOLOGY

2.2–188 551.311.12

Pillewizer, Wolfgang, **Zur Frage jahreszeitlicher Schwankungen in der Geschwindigkeit der Gletscherbewegung.** [On the question of seasonal variations in the speed of glacier movement.] *Zeitschrift für Gletscherkunde und Glazialgeologie*, Innsbruck, 1(1):29–38, **1949.** 4 figs., 3 tables, 14 refs. **MH-BH**—Photogrammetric measurements of movement of Mittelbergferner Glacier (Tyrol) Aug. 1938–Sept. 1939 showed the most rapid movement in high summer (15% above annual mean) and slowest in winter (10% below mean). In the ice fall there was little annual variation. Remarks by P.-L. Mercanton, **À propos des changements saisonniers de la vitesse des glaciers,** *ibid.*, (2):193–194, 1950. *Subject Headings:* **Glaciers, Tyrol, Austria.**—*C.E.P.B.*

2.2–189 551.311.12:551.583.2(931)

†Suggate, R. P., **Franz Josef and other glaciers of the Southern Alps, New Zealand.** *Journal of Glaciology*, 1(8):422–429, Oct. **1950.** 3 figs., table, 21 refs. **DLC**—Published literature on the glaciers of the Southern Alps, New Zealand and especially Franz Josef Glacier, is reviewed. Glacier retreated rapidly 1933–1946, then slight advance. Comparison with rainfall temperature and sunshine shows that advances and retreats followed about 5 years after max. and min. of precipitation, but the recent advance follows a period (1941–1946) of deficient sunshine and temperature. *Subject Headings:* **Glaciers, Climatic variations, New Zealand Alps.**

2.2–190 551.311.12(57)

Avsiuk, G. A., **O nekotorykh voprosakh glatsiologii.** [Some problems of glaciology.] *Problemy Fizicheskoĭ Geografii*, 13:122–144, **1948.** 3 figs., table, 14 refs. **DLC**—The author criticizes the failure of modern glaciology to regard glaciers as physical geographical entities whose characteristics are determined by their physical geographic environment and stressed the need for more data on thickness, thermodynamics and temperature regime of glaciers. On the basis of data obtained from the Tien Shan glaciers the author discusses the movement of mountain glaciers, the role of their temperature regime, gravitational flow, flow resulting from differences in pressure, impeded flow and the regulation of glaciers by drainage. The nature of and factors determining the erosive action of mountain glaciers are considered. *Subject Headings:* **Glaciology, Tien Shan Mountains, Kirgiz Region, U.S.S.R.**—*I.L.D.*

PART II. SELECTIVE ANNOTATED BIBLIOGRAPHY ON LONG RANGE FORECASTING

By: *Charles Ernest Pelham Brooks*

EXPLANATORY NOTE

This bibliography is a continuation of the Selective Annotated Bibliography on General and Extended Forecasting which appeared in the January 1951 issue of *Meteorological Abstracts and Bibliography*. Out of hundreds of papers which might have been included, 225 have been selected as most indicative of progress (or attempts at making progress) in the field of forecasting weather for a month, a season, a year or more in advance. Forecasting for less than a month was considered to be an extension or extrapolation of short range synoptic weather forecasting methods. Material on this type of forecasting included in the Extended Forecast Bibliography will not be repeated here, even though some of it might be considered pertinent to the subject of Long Range Forecasting.

The various bases and methods or schools of thought represented, and the types of phenomena forecast can be clearly seen from the following *Subject Outline*. The continents or regions involved are listed in the *Geographical Outline*.

Studies of the General Circulation, which show great promise in the future improvement of long range forecasting, constitute the subject for an entire and separate bibliography. Only a few papers on this aspect could be included in the limited space allotted to Long Range Forecasting.

We wish to again express our gratitude to Mr. JEROME NAMIAS for permission to refer to an unannotated but very complete "*Bibliography on Long Range Forecasting (for 1940 to 1948)*" prepared under his direction by WALTER G. LEIGHT of the Extended Forecast Section, U. S. Weather Bureau.

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MONTHLY, SEASONAL AND ANNUAL FORECASTING

1555

2B–1 551.509.33:551.590.23

Dygges, Leonard, **A prognostication of right good effect, fructfully augmented contayninge playne, briefe, pleasant, chosen rules, to iudge the wether for euer, by the Sunne, Moone, Sterres, Cometes, Raynbowe, Thunder, Cloudes, with other Extraordinarie tokens, not omitting the aspectes of Planetes, with a brefe iudgemente for euer, of Plentie, Lacke, Sickenes, Death, Warres &c., Openinge also many naturall causes, woorthy to be knowen, to these and others, now at the last are adioyned, divers generale pleasaunte Tables, for euer manyfolde wayes profitable, to al maner men of any understanding therefore agayne publisshed . . . in the year of oure Lorde, 1555.** Old Ashmolean reprints, Oxford, **1926.** 76 p. **DWB**—This work is typical of much early literature. For other reprints see: HELLMANN, G., **Neudrucke von Schriften und Karten über Meteorologie und Erdmagnetismus.** [Reprints of texts and charts on meteorology and terrestrial magnetism] No. 1–15, Berlin (Asher) 1893–1904, and **Beiträge zur Geschichte der Meteorologie.** [Contributions

to the history of meteorology] II:167–229, Berlin, 1917. See also THORNDIKE, L., **A history of magic and experimental science III, IV, Fourteenth and fifteenth centuries** (*History of Science Society Publications, New Series*, 4), Columbia, University Press, 1934. An account of the latter volume is given in *Meteorological Magazine*, 71(843):62–64, April 1936. *Subject Headings:* **Long range forecasting, History, Planetary influences.**

1842

2B–2 551.509.33

Howard, Luke, **A cycle of eighteen years in the seasons of Britain; deduced from meteorological observations made at Ackworth, in the West Riding of Yorkshire from 1824 to 1841.** London, **1842.** 22 p. 5 plates, tables. **DWB**—Howard thought this cycle might be of use in forecasting. The basis was of course quite insufficient. *Subject Headings:* **Long range forecasting, Periodicities.**

1861

2B–3 551.509.33:551.577.3

Fullbrook, Charles, **The wet and dry seasons of England, from the year 1846 to 1860, inclusive; their agreement with rule and system; with some remarks on the probable character of the following four years, 1861 to 1864 inclusive, and on the expected extremely wet season, founded on rules deduced from a long series of observations of the rainfall.** London, Henry Renshaw, **1861. DWB** —Based on weather cycles of about 3–5 years, corresponding with certain astronomical periods. The forecasts failed. *Subject Headings:* **Long range forecasting, Periodicities.**

1881

2B–4 551.509.33:551.513.3

§Teisserenc de Bort, Léon, **Étude sur l'hiver de 1879–1880 et recherches sur la position des centres d'action de l'atmosphère dans les hivers anormaux.** [Study of the winter of 1879/1880 and researches on the centers of action of the atmosphere in abnormal winters.] France, *Bureau Central Météorologique de France, Annales*, **1881**, Pt. 4:17–62, 1883. 232 charts. **DWB**—Planned as a first step towards long range forecasting by determining the connection between the weather and the general circulation. The areas of high and low pressure are termed "centers of action" and the various types of weather caused by their displacements are analyzed and classified. The magnificent series of charts includes daily isobars and isotherms for the Northern Hemisphere from Nov. 18, 1879 to Feb. 29, 1880, mean isobars and trajectories of depressions for characteristic periods. Less complete daily series and monthly means for Europe and Asia for earlier severe winters (classified according to type) are added. *Subject Headings:* **Long range forecasting, Centers of action, Severe winters.**

1884

2B–5 551.509.33:551.578.4

§Blanford, Henry F., **On the connexion of the Himalaya snowfall with dry winds and seasons of drought in India.** *Royal Society of London, Proceedings*, 37(232):3–22, **1884.** fig., table, refs. **DWB**—A classical paper; the beginning of seasonal forecasting in India. Unusually heavy and especially late snow on N.W. Himalayas is followed by prolonged drought in plains of N.W. and W. India. Winter and spring rainfall in N.W. Himalayas is inversely related to summer monsoon in the plains. Meteorological causes are explained and illustrated by synoptic chart for Feb. 10, 1881. "This dependence of dry winds on the Himalayan snowfall affords a criterion for forecasting the probabilities of drought in Northwestern and Western India." *Subject Headings:* **Long range forecasting, Monsoon forecasting, India.**

1889

2B–6 551.509.33:551.577.33

Hutchins, D. E., **Cycles of drought and good seasons in South Africa. With cyclical diagrams.** Wynberg, "Times" Office, **1889.** 137 p. 4 fold. diagrams, tables. **DWB**—Author devised a rather complicated rainfall cycle based essentially on a sunspot periodicity of 11.11 years, a "storm cycle" of 9.5 years and a "mitigation" cycle of 12.5 years. He gave a forecast of annual rainfalls 1889–1920 in South Africa. [C. E. P. BROOKS subsequently compared forecast with observed rainfall with a worse than "chance" result.] *Subject Headings:* **Long range forecasting, Periodicities, South Africa.**

1897

2B–7 551.509.33:551.513.3

Hildebrandsson, H. Hildebrand, **Quelques recherches sur les centres d'action de l'atmosphère. I. Écarts des moyennes barométriques mensuelles. II. La pluie. III, IV. Sur la compensation entre les types des saisons simultanés en différentes régions de la terre. V. Fin.** [Some researches on centers of action in the atmosphere. I. Deviations of monthly barometric means. II. Rain. III, IV. On the compensation between simultaneous types of seasons in different regions of the earth. V. End.] (*K.*) *Svenska Vetenskaps-akademiens, Handlingar*, 29(3), **1897.** 36 p. 7 plates; 32(4), 1899. 22 p. 4 plates; 45(2), 1909, 11 p. 4 plates; 45(11), 1910. 22 p. 7 plates; 51(8), 1914. 16 p. 13 plates. **DWB**—This classical series of memoirs sets out the interrelations of seasonal variations in different parts of the world in considerable detail. Some examples of relations in successive seasons are included. In Pt. III it is shown that the principal cause of different types of season must be sought in polar ice. The results are not sufficient to establish long range forecasts but in certain cases they give indications worthy of attention. The local interrelations are overriden by variations of higher order common to the whole world, which are attributed to sunspots and volanic eruptions. *Subject Headings:* **Long range forecasting, Centers of action, Polar ice.**

1904

2B–8 551.509.33

Garriott, E. B., **Long range weather forecasts.** *U. S. Weather Bureau, Bulletin*, No. 25, **1904.** 68 p. fig. **DWB**—Mainly an indictment of quack forecasts but contains the information that temperature of Aleutian Is. is inversely related to subsequent rainfall of California. *Subject Headings:* **Long range forecasting, Correlations, California.**

2B–9 551.543.3

Lockyer, Sir Norman and Lockyer, William J. S., **The behaviour of the short-period atmospheric pressure variation over the earth's surface.** *Royal Society of London, Proceedings*, 73:457–470, **1904.** fig., 2 plates. **DWB**—The world is divided into two regions, of Indian and Cordoba type, in which the pressure variations are opposite. The opinion is expressed that this may help in long range forecasting. *Subject Headings:* **Long range forecasting, Periodicities.**

1910

2B–10 551.513:551.465

Petersen, J., **Unperiodische Temperaturschwankungen im Golfstrom und deren Beziehung zu der Luftdruckverteilung.** [Non-periodic variations of temperature in the Gulf Stream and their relation to the pressure distribution.] *Annalen der Hydrographie und Maritimen Meteorologie*, 38:397–417, **1910.** **DLC**—The position of the Icelandic Low is controlled by a self-regulating mechanism based on the effect of winds and currents associated with the Icelandic Low on the temperature of the Gulf Stream Drift. *Subject Headings:* **Long range forecasting, Icelandic Low, Gulf Stream.**

1914

2B–11 551.509.33:551.577.3

Brown, A. Hampton, **A Cuban rain record and its application.** *Royal Meteorological Society, Quarterly Journal*, 40(172):295–306, Oct. **1914.** 2 figs., 5 tables. Discussion p. 306–309. **MH-BH**—Author found a correlation of −.51 between rainfall of Havana May–Oct. and of S.W. England in following Jan.–March. For a few years forecasts based on this were issued in *Symons' Meteorological Magazine*. *Subject Headings:* **Long range forecasting, Correlations, England.**

2B–12 551.577.33

Moore, Henry Ludwell, **Economic cycles; their law and cause.** New York, **1914.** 149 p. **DWB**—Author found periodicities of 8 and 33 years in long rainfall series for Ohio Valley and Illinois. *Subject Headings:* **Longe range forecasting, Periodicities, United States.**

1916

2B–13 551.509.33:551.515.7:523.74

Fischer, R., **Einfluss der Sonnenflecken auf Lage der Hoch- und Tiefdruckgebiete im Sommer.** [Influence of sunspots on the position of high and low pressure regions in summer.] *Das Wetter*, 33:232–237, **1916.** **DWB**—In summers near sunspot min. and 1–3 years before spot max. an intense anticyclone tends to extend over or near central Europe and remain stationary for a long period

while depressions are confined to western seaboard. In summers near spot max. the anticyclone lies to E or SE, occasionally S or SW of Europe; secondary depressions cause heavy rain and frequent thunder in central Europe. One to 4½ years after spot max. the anticyclone lies to S or SW. *Subject Headings:* **Long range forecasting, Anticyclones, Sunspots.**

2B–14 551.509.33

Gallé, P. H., **On the relation between fluctuations in the strength of the trade winds of the North-Atlantic Ocean in summer, and departures from the normal of the wintertemperature in Europe.** (*K.*) *Akademie van Wetenschappen te Amsterdam, Proceedings*, 18:1435–1448, **1916.** fig., 6 charts, 2 tables, 12 refs. (Reprint available.) **DWB.** Also in Dutch in (*K.*) *Nederlandisch Aardrijkskundig Genootschap, Tijdschrift*, Ser. 2, 34:192–210, 1917. **GB-MO**—Correlations between strength of NE trade in various periods and subsequent winter temperature of Holland, Germany, Iceland and Greenland are largest between trade May–Oct. and temperature Dec.–Feb.; isocorrelates show a max. of +0.8 in central Germany, negative in Arctic regions. *Subject Headings:* **Long range forecasting, Correlations, Trade winds.**

2B–15 551.509.33:551.515.7

Göschl, F., **Tabellarische Übersicht über langsame Hochdruckwanderungen seit 1910.** [Tabular summary of slow movements of high pressure areas since 1910.] *Meteorologische Zeitschrift*, 33:230–232, **1916.** table. **DWB**—Reports a periodicity of 3.2 months in rapidly moving anticyclones across Europe, 6.3 months in those of moderate speed and 13.3 months in great slow-moving ones. Data only 1910–1916, handled somewhat artificially. *Subject Headings:* **Long range forecasting, Anticyclones, Periodicities.**

2B–16 551.509.33

Hessling, N. A., **Correlación entre las temperaturas de las Orcadas y las lluvias en la República Argentina.** [Correlation between the temperatures of the Orkneys and the rains of the Argentine Republic.] *Argentina, Oficina Meteorológica Nacional, Boletin Mensual*, 1(11):36–40, **1916.** 2 figs., 2 tables. **DWB.** Translation in *Symons' Meteorological Magazine*, 52:73–75, 1917. **DLC**—Author found high negative correlations (only 10–14 cases) between temperature in S. Orkneys April–Nov. and rainfall of Argentina 2½–4 years later. The relation acts through Antarctic ice. Some similar relations were found in N. Atlantic but on scanty data. *Subject Headings:* **Long range forecasting, Correlations, Argentina.**

1917

2B–17 551.509.33:551.513.7

Okada, Takematsu, **Some researches in the Far Eastern seasonal correlations, (Second note).** *Meteorological Society of Japan, Journal*, 36:41–49, 55–63, 65–78, **1917.** **DWB**—Lists a large number of correlation coefficients between monthly or seasonal mean temperatures at places in Japan and meteorological conditions some months before in different parts of the world. Regression equations are given in favorable cases. This paper is typical of a number of correlation papers published in Japan about this time. Pt. 1 appears to be in Japanese only. *Subject Headings:* **Long range forecasting, Correlations, Japan.**

1918

2B–18 551.509.33:551.465

Brooks, Charles F., **Ocean temperatures in long-range forecasting.** *Monthly Weather Review*, 46:510–512, **1918.** **DWB.** Also in: University of California Semicentenary Celebration 1868–1918. 13 p.—A discussion of the origin of anomalies of ocean surface temperatures and their travel. Pressure anomalies are considered to follow temperature anomalies. *Subject Headings:* **Long range forecasting, Sea temperatures.**

1919

2B–19 551.509.33

Braak, C., **Atmospheric variations of short and long duration in the Malay Archipelago and neighbouring regions and the possibility to forecast them.** *Indonesia*, (*K.*) *Magnetisch en Meteorologisch Observatorium te Batavia, Verhandelingen*, No. 5, **1919.** 57 p. **DWB**—A 3-year periodicity in pressure at Batavia and Darwin (Australia) is attributed to a "resonance effect" in the west monsoon, and rainfall forecasts for Java based on it were being issued. The resonance principle is discussed by C. E. P. Brooks in *Meteorological Magazine*, 55:205–206, 1920, reprinted in *Monthly Weather Review*, 48:596–597, 1920. *Subject Headings:* **Long range forecasting, Periodicities, Java.**

2B–20 551.509.33

Sutton, J. R., **A note on the possibility of long-range weather forecasts.** *Royal Society of South Africa, Transactions*, 8:17–19, 1919. **DWB**—In South Africa the effect of excess rainfall in May is to lower the temperature of June. *Subject Headings:* **Long range forecasting, South Africa.**

1920

2B–21 551.509.33

Knoch, K., **Grundlagen und Treffsicherheit der langfristigen Wettervorhersagen von Wilh. Krebs.** [Basis and accuracy of the long range forecasts of Wilh. Krebs.] *Berlin, Meteorologisches Institut, Veröffentlichungen*, 320:81–88, 1920–3. **DWB**—KREBS issued long range forecasts regularly in 1923 based on sunspots and faculae, volcanic eruptions, a progression of weather from low to high latitudes, and regular oscillations of rainfall. A careful check by KNOCH showed many more failures than successes. *Subject Headings:* **Long range forecasting, Forecast verification.**

2B–22 551.509.33:551.577.8:523.74

Pickering, W. H., **The relation of prolonged tropical droughts to sunspots.** *Monthly Weather Review*, 48:589–592, 1920. **DWB**—Drought in Jamaica is defined as a deficiency of rainfall lasting at least 10 months and exceeding 12 inches. From 1873 to 1920 there were 12 droughts, of which 5 followed sunspot maxima (mean duration 1.7 years, lag of end of drought 2.3 ± 0.5 years). Four followed spot minima (duration 1.1 years, lag of end 1.4 ± 0.3) and 3 were independent of sunspots. Relation close enough for prediction. *Subject Headings:* **Long range forecasting, Drought, Sunspots, Jamaica.**

1921

2B–23 551.509.33:551.513.7

Aoki, Seiiti, **The correlation between the winter air temperature in South Manchuria and the late spring temperature in the central part of Japan.** *Meteorological Society of Japan, Journal*, 40:103, 1921. In Japanese. **DWB**—Correlations: Jan. mean minimum temperature at Mukden with May mean minimum at stations in central Japan +.50 to .79. The first and second decades of Jan. are more important than the third. *Subject Headings:* **Long range forecasting, Correlations, Japan.**

2B–24 551.509.33:551.577.38

Brooks, C. E. P., **Could the drought of 1921 have been forecasted?** *Meteorological Magazine, London*, 56(668):211–215, 1921. **MH-BH**—A study of the pressure distribution Feb.–June 1921 and comparison with 1911 suggests that preceding pressures and temperatures in the Arctic could have given a clue. *Subject Headings:* **Long range forecasting, Analogues, Drought, Europe.**

2B–25 551.509.33:551.577

Henry, Alfred J., **Seasonal forecasting of precipitation. Pacific Coast.** *Monthly Weather Review*, 49:213–219, April 1921. 3 figs., 3 tables. **DWB**—Examination of past data leads to the conclusion that pressure distribution over northeastern Pacific and northwestern Canada is the most hopeful approach. *Subject Headings:* **Long range forecasting, Pressure anomalies, Pacific Coast.**

2B–26 551.509.33:551.513.7

Walker, Sir Gilbert T., **Correlation in seasonal variations of weather. VII The local distribution of monsoon rainfall.** *India, Meteorological Dept., Memoirs*, 23(2):23–40, 1921. **DWB**—India is divided into districts and formulas for monsoon forecasts are worked out separately for each, based on correlations with previous pressure, temperature and rainfall in a variety of places. *Subject Headings:* **Long range forecasting, Correlations, India.**

1922

2B–27 551.509.33:551.577.38

Brooks, C. E. P. and Glasspoole, J., **The drought of 1921.** *Royal Meteorological Society, Quarterly Journal*, 48:139–166, 1922. 21 figs., 10 tables. **MH-BH**—World anomalies of pressure associated with 8 severe droughts in British Isles are mapped and a generalized chart drawn. It is shown that drought of the most frequent type is associated with a northward migration of the sub-tropical high pressure belt and low Arctic pressure. The preceding two months are characterized by prevailing southerly winds over northern Europe and the northeast Atlantic. Droughts also tend to occur about 4 years after sunspot max. or 2 years after spot min. Brief rules for forecasting droughts given. *Subject Headings:* **Long range forecasting, Drought, Pressure anomalies, British Isles.**

2B–28 551.509.33:551.577

Robertson, C. L., **The possibility of seasonal forecasting and prospects for rainfall season 1922–23.** *Rhodesia Agricultural Journal*, p. 648–655. **1922. DWB**—A forecast of rainfall of S. Rhodesia is based on a regression equation from correlations with distant regions and previous years. *Subject Headings:* **Long range forecasting, Correlations, Rhodesia.**

2B–29 551.509.33:551.311.181

Vize, V. IU., **Die Einwirkung des Polareises im Grönländischen Meere auf die Nordatlantische zyklonale Tätigkeit.** [The effect of polar ice in the Greenland Sea on North Atlantic cyclonic activity.] *Annalen der Hydrographie und Maritimen Meteorologie*, 50:271–280, **1922.** tables. **DLC**—Author finds a correlation of −.83 between Siberian temperature (Obdorsk+Turukhansk) Sept.–Nov. and ice in Greenland Sea 4½ years later. The mean track of depressions over Europe in years of heavy ice in Greenland Sea is 3° further south in summer and 4° in autumn than in years of light ice. This affects pressure distribution and contemporary weather in N.W. Europe. *Subject Headings:* **Long range forecasting, Polar ice, Correlations, Cyclone tracks.**

1923

2B–30 551.509.33:551.543.3

Braak, C., **Seasonal forecasting.** *Pan-Pacific Science Congress, Proceedings*, Melbourne Meeting, 1:649-652, **1923. DWB**—Brief description of method of forecasting seasonal rainfall of Java by 3-year periodicity, and its physical basis. *Subject Headings:* **Long range forecasting, Periodicities, Java.**

2B–31 551.513:551.465

Brooks, C. E. P., **The east-west oscillation of the Icelandic minimum as shown by monthly pressure charts.** *Meteorological Magazine, London*, 58:173–178, **1923.** 2 figs., 2 tables, 4 refs. **MH-BH**—*See item* 2B–10, J. PETERSEN. From speeds of ocean currents the Icelandic Low should complete an E–W–E oscillation in 11 months. Observed cycle (1873–1916) was irregular; 12 and 11 months were most frequent but it was influenced by Azores-Iceland pressure difference. *Subject Headings:* **Long range forecasting, Icelandic Low, Ocean currents.**

2B–32 551.509.33:551.509.318

Mascart, Jean, **Sur le problème de la prévision du temps à longue échéance.** [The problem of long range weather forecasting.] *Observatoire de Lyon, Bulletin*, 5:1–4, **1923. GB-MO**—An attempt at monthly forecasting (on 20th of preceding month) by method of analogues gave 65% successes, but if only quite unambiguous forecasts were counted, successes fell to 56%. This is still better than forecasts based on chance and climatic probability, and author thinks it should be followed up. *Subject Headings:* **Long range forecasting, Analogues.**

2B–33 551.509.33:551.513.7

Walker, Sir Gilbert T., **Correlation in seasonal variations of weather VIII. A preliminary study of world weather.** *India, Meteorological Dept., Memoirs*, Poona, 24(4):75–132, **1923. DWB**—Correlations and regression equations are given for a number of stations between: sunspots and pressure, temperature, wind, cloud, rain, floods; relations, contemporary and deferred, between centers of action; study of temperature variations. Attempts are made at physical interpretations of the relationships. *Subject Headings:* **Long range forecasting, Centers of action, Correlations.**

1924

2B–34 551.509.33:551.513

Baur, Franz, **Der gegenwärtige Stand der langfristigen Wettervorhersage.** [The present position of long range forecasting.] *Naturwissenschaft*, 12:342–345, **1924. DLC**—Points out that previous attempts at long range forecasting have been only local; observation of the whole atmospheric circulation and its disturbances is a necessary basis. Periodicities of several years, which can be important, are forced oscillations under the action of permanent external forces. *Subject Headings:* **Long range forecasting, Atmospheric circulation, Periodicities.**

2B–35 551.509.33

*Baur, Franz, **Witterungsperioden I. Mitt.** [Weather periodicities. First communication.] *Wetter- und Sonnenwarte*, St. Blasien, Heft 3:1–37, **1924.** 2 figs., 10 tables. **DWB**—Pt. 1, the regularity of oscillations, sets out mean deviations of various elements from long period means for a number of stations (annual values). Pt. 2 discusses periodogram analysis of meteorological and

solar data. In Pt. 3 many year periodicities of pressure in action centers are examined and the amplitudes of harmonics of 72 or 36 years set out for different periods. Pt. 4 discusses the 11-year temperature oscillation in the Northern Hemisphere, the lag after the sunspot cycle being charted. *Subject Headings:* **Long range forecasting, Periodicities, Sunspots.**

2B–36 551.543.4

*Defant, A., **Die Schwankungen der atmosphärischen Zirkulation über dem nordatlantischen Ozean im 25-jährigen Zeitraum 1881–1905.** [The variations of the atmospheric circulation over the North Atlantic Ocean in the 25-year period 1881–1905.] *Geografiska Annaler*, 6:13–41, **1924. DWB**—Author calculated mean pressure difference 30–65°N over North Atlantic for each month. Considerable persistence was found in winter but not in other seasons. *Subject Headings:* **Long range forecasting, Atmospheric circulation, Persistence, North Atlantic.**

2B–37 551.513.7

*Exner, Felix M., **Monatliche Luftdruck- und Temperaturanomalien auf der Erde. Korrelationen des Luftdrucks auf Island mit dem anderer Orte.** [Monthly pressure and temperature anomalies over the earth. Correlations of pressure at Iceland with those of other places.] *Vienna, Akademie der Wissenschaften, Sitzungsberichte*, 2a, 133:307–408, **1924.** 6 figs., numerous tables. **Beziehungen von Luftdruckanomalien auf der Erde zueinander.** [Relations of pressure anomalies on the earth one to another.] *Ibid.*, 135:333–356, 1926. 22 figs., 2 tables. **DLC**—The 1924 paper sets out monthly deviations of pressure and temperature from normal for a number of stations, 1887–1916. Monthly pressures at pairs of distant stations are correlated and a number of relationships are plotted, forming a pattern of linked oscillations, partly thermal and partly dynamic in origin. These should be of value in forecasting monthly pressure distributions. *Subject Headings:* **Long range forecasting, Correlations, Pressure anomalies, Temperature anomalies.**

2B–38 551.509.33:551.513.7

Georgii, Walter, **Korrelation der Sommertemperatur in Mitteleuropa mit den Luftdruckverhältnissen voraufgehender Jahreszeiten in Süd- und Nordamerika.** [Correlation of summer temperature in Central Europe with pressure conditions of preceding seasons in South and North America.] *Annalen der Hydrographie und Maritimen Meteorologie*, 52:166–168, **1924. DLC**—Gives a regression equation for forecasting Frankfurt temperature June–Aug. from pressure at Buenos Aires (Nov.–Feb.), Punta Arenas and Winnipeg (Dec.–Feb.), and Falkland Is. (March–May) of preceding year. Basic coefficients only .3 to .4. No relation is found to preceding winter pressure in Siberia. *Subject Headings:* **Long range forecasting, Correlations, Frankfurt, Germany.**

2B–39 551.509.33:551.526.6:551.577.3

McEwen, George F., **Forecasting seasonal rainfall from ocean temperatures. Indications for the 1924–25 season in Southern California.** *American Meteorological Society, Bulletin*, 5:137–139, **1924.** fig., table. **MH-BH**—Ocean surface temperature Aug. 1–Oct. 15 at Scripps Institute reversed, agreed with average rainfall at 6 stations July through June 1916–17 to 1924–25. A change of 1°F. gives a change of 2 in. rain. Departure of +5 in. predicted for 1924–25. *Subject Headings:* **Long range forecasting, Sea temperatures, California.**

2B–40 551.509.33:551.311.181

Vize, V. IU., **Polareis und atmosphärische Schwankungen.** [Polar ice and atmospheric variations.] *Geografiska Annaler*, 6:273–299, **1924.** figs. **DWB**—Compares years of heavy and light ice in Barents and Greenland Seas, gives regression equations for forecasting ice area in Barents Sea and shows how ice area affects mean cyclone tracks. *Subject Headings:* **Long range forecasting, Polar ice, Cyclone tracks.**

1925

2B–41 551.509.33:551.577.3

Blochman, L. E., **A study of seasonal forecasting for California based on an analysis of past rainy seasons.** *Monthly Weather Review*, 53:489–493, Nov. **1925.** 3 tables. Discussion by A. J. Henry p. 493–494. **MH-BH**—When low pressure areas enter central to southern California coast in Sept. or Oct., rainfall of ensuing season will be average or plus. When San Diego has plus rains (July, Aug. or Sept.), following rainy season will be wet. All dry seasons follow rainless summers. *Subject Headings:* **Long range forecasting, California.**

2B–42 551.509.33:517.512.2

*Brunt, D., **Periodicities in European weather.** *Royal Society of London, Philosophical Transactions, Ser. A*, 225:247–302, **1925.** 24 figs., 12 tables, append. gives 12 tables of data. **DWB**—

The main part consists of periodograms (amplitude and phase), 3 months to 35 years, of 100 year series of rainfall at Milan, Padua, London, Edinburgh; pressure at Edinburgh and Paris; temperature at Edinburgh, Stockholm, London, Berlin, Paris, Vienna. All monthly values are given in the appendix. So many periodicities were found that "these results cannot be profitably utilized for forecasting the general nature of next year's weather." *Subject Headings:* **Long range forecasting, Periodicities.**

2B–43 551.509.33:551.543

Henry, Alfred J., **Monthly pressure variations in the Northern Hemisphere and seasonal weather forecasting.** *Monthly Weather Review*, 53:528–534, 1925. **MH-BH**—Author plotted monthly pressure anomalies 1910–1917 from Réseau Mondial and discussed marked deviations from standpoint of seasonal forecasting, and their effect on temperature in the United States. Correlations between distant regions are also discussed briefly. *Subject Headings:* **Long range forecasting, Pressure anomalies.**

2B–44 551.509.33

Reed, Charles D., **Monthly forecasts by correlation. June, a key month.** *Monthly Weather Review*, 53:249–251, June 1925. 4 figs. **MH-BH**—In Iowa mean temperature of June has a correlation of +.56 with mean of July through Sept., +.39 with July temperature and −.49 with July rainfall. Isopleths of percentage frequency warm June-dry July are given for mid-west States. *Subject Headings:* **Long range forecasting, Correlations, Persistence, United States.**

2B–45 551.509.33:551.513.7

Vize, V. IU. **Die Einwirkung der mittleren Lufttemperatur im Frühling in Nord-Island auf die mittlere Lufttemperatur des nachfolgenden Winters in Europa.** [The effect of the mean air temperature in spring in north Iceland on the mean air temperature of the following winter in Europe.] *Meteorologische Zeitschrift*, 42(2):53–57, Feb. 1925. fig. **MH-BH**—Air temperature at Grimsey March–May varies inversely as amount of ice in Greenland Sea. This is correlated with air temperature in following Dec.–Jan. in northern Europe. Isocorrelates exceed .5 in northeast Germany. *Subject Headings:* **Long range forecasting, Correlations.**

2B–46 551.509.33:551.524.34

Vize, V. IU., **Studien über die Erhaltungstendenz der mittleren monatlichen Temperaturanomalien. I, II.** [Studies on the persistence tendency of mean monthly temperature anomalies. Pt. I, II.] *Meteorologische Zeitschrift*, 42:217–225, 1925; 43:214–216, 1926. 9 figs., tables. **MH-BH**—Gives correlation coefficients between mean air temperatures of successive months at a number of stations, nearly all positive, and maps of isocorrelates. Correlations between mean sea surface temperatures of successive months are much higher (around +.7). Coefficients are generally higher near sunspot min. than spot max. In Pt. II correlations are extended to 2nd and 3rd following months. Relations are not quite linear and correlation ratios are also discussed. *Subject Headings:* **Long range forecasting, Persistence, Sea temperatures.**

2B–47 551.509.33

von Myrbach, Otto, **Das Atmen der Atmosphäre.** [The breathing of the atmosphere.] *Meteorologische Zeitschrift*, 42:10–14, 1925. 2 figs. **MH-BH.** *Idem.*, **Das Atmen der Atmosphäre unter kosmischen Einflüssen.** [The breathing of the atmosphere under cosmic influences.] *Annalen der Hydrographie und Maritimen Meteorologie*, 54:94–105, 145–168, 1926. **DLC**—R. Vogel suggested in 1921 that weather of Vienna changed every 8 weeks. Investigating this, Myrbach found periodicities in temperature of about 45, 60 and 70 days in years rich in sunspots, 65 and 75 days in quiet years. Also maxima at 160, 245 and 450 days. These are attributed to an automatic pressure alternation over continents and oceans. *Subject Headings:* **Long range forecasting, Periodicities.**

1926

2B–48 551.509.33:551.513.7

Baur, Franz, **Bedingungen und Vorhersage des Niederschlagscharakters des Juli in Deutschland.** [Conditions and forecast of rainfall character of July in Germany.] *Meteorologische Zeitschrift*, 43(1):1–15, 1926. 3 figs., 6 tables. **MH-BH**—From correlation coefficients author infers that rainfall of July in northwest Germany is connected with upper air pressure in Central Europe (dry with subtropical air in stratosphere). This pressure distribution tends to develop in the last decade of June. A regression equation connects rainfall in July in northern Germany west of the Oder with pressure in Karlsruhe June 21–30 and in Tromsö June 1–20. The mean error of 20 mm. is only 8% less than scatter of observations. *Subject Headings:* **Long range forecasting, Correlations, Germany.**

2B–49 551.509.33:551.513.7

Baur, Franz, **Grundlagen einer Vierteljahrstemperaturvorhersage für Deutschland.** [Basis of a quarterly temperature forecast for Germany.] Braunschweig, **1926.** 40 p. tables. **DWB**—From a number of correlation coefficients with temperature of northern Norway, western Greenland, and eastern U.S.A., pressure difference Ponta Delgada—Iceland, and pressure in Argentina and Bombay, author calculates regression equations for forecasting temperature of Germany in each season. *Subject Headings:* **Long range forecasting, Correlations, Germany.**

2B–50 551.509.33:551.513.7

Bliss, E. W., **British winters in relation to world weather.** *Royal Meteorological Society, Memoirs,* 1(6):87–92, **1926.** 3 tables. **DWB**—Greenwich temperature Dec.–Feb. is related to preceding pressure at Cairo, temperature at Madras, Samoa, Batavia and Perth, and Nile flood. *Subject Headings:* **Long range forecasting, Correlations, England.**

2B–51 551.509.33:551.513.7

Bliss, E. W., **The Nile flood and world weather.** *Royal Meteorological Society, Memoirs,* 1(5):79–85, **1926.** fig., 4 tables. Summary and discussion p. 146–148. **DWB**—An equation is found for forecasting the Nile flood on June 1 from temperature at Dutch Harbor and Samoa and pressure at Darwin. Multiple correlation .72. *Subject Headings:* **Long range forecasting, Correlations, Nile flood.**

2B–52 551.509.33:551.465

Brooks, C. E. P., **The effect of the fluctuations of the Gulf Stream on the distribution of pressure over the eastern North Atlantic and Western Europe.** *Great Britain, Meteorological Office, Geophysical Memoirs,* 4(34), **1926.** 36 p. 11 figs., 26 tables. **MH-BH.** Summary by A. J. Henry in *Monthly Weather Review,* 55:359–361, 1927. **DWB**—Correlation coefficients (mostly small) are given between northeast and southeast trades and subsequent pressures over North Atlantic and West Europe. *Subject Headings:* **Long range forecasting, Gulf Stream, Correlations.**

2B–53 551.509.33:551.577.37

Brooks, C. E. P., **Pressure distributions associated with wet seasons in the British Isles.** *Royal Meteorological Society, Quarterly Journal,* 52:387–401, **1926.** 14 figs., table. **MH-BH**—World charts of pressure anomaly associated with 14 periods of several months each of persistent excess rainfall are drawn and classified into orographic and cyclonic types. Values of various factors 3 to 12 months before are tabulated for each and some degree of prediction is found to be possible, though not enough to issue forecasts. *Subject Headings:* **Long range forecasting, Pressure anomalies, Rainy seasons.**

2B–54 551.509.33

Brooks, C. E. P., **The variation of pressure from month to month in the region of the British Isles.** *Royal Meteorological Society, Quarterly Journal,* 52:263–275, **1926.** 6 figs., 4 tables. **MH-BH**—It is shown that centers of excess and deficit of pressure on monthly mean charts of surface pressure anomaly in the Northern Hemisphere tend to move east or northeast along fairly definite tracks, which are plotted and numbered. These movements are most regular in spring when they could give fairly successful monthly forecasts. *Subject Headings:* **Long range forecasting, Pressure anomalies.**

2B–55 551.509.33:551.509.318

Brooks, C. E. P. and Quennell, Winifred A., **Classification of monthly charts of pressure anomaly.** *Great Britain, Meteorological Office, Geophysical Memoirs,* 4(31), **1926.** 12 p. 36 figs., 4 tables. **MH-BH**—Charts of Northern Hemisphere pressure isanomals for each month 1873–1918 are classified into 29 types by distribution over North Atlantic and Europe. Frequencies and sequence analyzed. *Subject Headings:* **Long range forecasting, Pressure anomalies, Weather types.**

2B–56 551.509.33:551.311.181

Vize, V. IU., **K voprosu o dolgosrochnom predskazanii kolichestva osadkov v aprele i mae v iuzhno tsentral'nom i vostochnom raĭonach Evropeĭskoĭ Rossii.** [On the long range forecasts of the amount of precipitation in the central and eastern parts of Russia in April and May.] *Glavnaia Geofizicheskaia Observatoriia, Geofizicheskiĭ Sbornik,* 4(3):87–98, **1926.** 3 figs. German summary p. 98. **GB-MO**—A relation is found between Barents Sea ice and rainfall in southeastern Russia in April and May of following year and pressure over Norwegian Sea in Jan. and Feb. There is also a correlation of −.52 with sunspots. *Subject Headings:* **Long range forecasting, Polar ice.**

2B–57 551.509.33

Walker, Sir Gilbert. **Some recent papers by V. IU. Vize.** *Meteorological Magazine, London,* 61(722):29–32, March **1926. MH-BH**—Summaries of: **On the possibility of a forecast of the ice conditions in the Barents Sea** (1923); **Ice in the polar seas and the general circulation of the atmosphere** (1924); **Ice in the Barents Sea and air temperatures in Europe** (1924); **The influence of the mean air temperature in spring in North Iceland on the mean air temperature of the following winter in Europe** (1925); **The fluctuations of hydrological elements, especially of the water level of Lake Victoria, in relation to the general circulation of the atmosphere and the sun's activity** (1925); **Long range forecasting of rain in central and east Russia in April and May** (1925); **Polar ice and atmospheric fluctuations** (1924). *Subject Headings:* **Long range forecasting, Polar ice, V. IU. Vize.**

2B–58 551.509.33

Wallén, Axel. **Zwölf Jahre langfristiger Prognosen von Niederschlag und Wasserstand.** [Twelve years' long range forecasts of rainfall and water level.] *Annalen der Hydrographie und Maritimen Meteorologie,* 54, Köppenheft:89–92, **1926.** 3 tables. **DWB.** Translation by B. M. VARNEY in *Monthly Weather Review,* 55:233–235, May 1927. **DWB**—Forecasts were based on periodicities of 28 months and 11 years by a method of extrapolating smoothed differences. Generalized forecasts of precipitation were successful in 13–14/15 cases, of water level in 15/16. *Subject Headings:* **Long range forecasting, Periodicities, Sweden.**

1927

2B–59 551.509.33:517.512.2

Alter, Dinsmore, **A group or correlation periodogram, with application to the rainfall of the British Isles.** *Monthly Weather Review,* 55(6):263–266, June **1927.** figs., graphs, refs. **MH-BH**—Describes a labor saving correlation periodogram. Applied to half-yearly rainfall of British Isles 1834–1924 showed four main peaks at 24½, 41, 51 and 34 years; these combined gave a correlation of .91 with original data. Based on these, the curve was extended to 1940 for experimental purposes. *Subject Headings:* **Long range forecasting, Periodicities, British Isles.**

2B–60 551.509.33:551.513.7

Baur, Franz, **Wert und Verwertung von Beziehungsgleichungen zur Voraussage von Mittelwerten der Wetterelemente für grössere Zeitabschnitte.** [Value and evaluation of regression equations for forecasting mean values of weather elements for long periods of time.] *Annalen der Hydrographie und Maritimen Meteorologie,* 55:36–41, **1927.** tables. **MH-BH**—A discussion of the difficulty of assessing the stability of meteorological correlations. If series can be split into two, his criterion of stability is that the difference between the coefficients is less than the sum of their probable errors. This is independent of the absolute magnitude of the coefficients. Illustrated by relations of mean autumn temperature of Germany. *Subject Headings:* **Long range forecasting, Correlations.**

2B–61 551.509.33:551.513.7

Baur, Franz, **Zusammenhänge des Witterungscharakters des März in Deutschland mit der gleichzeitigen und der vorausgegangenen Luftdruckverteilung.** [Connections of the character of the March weather in Germany with the synchronous and preceding pressure distribution.] *Beiträge zur Geophysik,* 18:225–246, 361–378, **1927.** 7 tables, 29 refs. **DWB**—In Pt. 1 the March weather in Germany is compared with synchronous temperature and pressure distributions over the Northern Hemisphere and 4 distinct types are found. Two depend on pressure anomaly at Iceland and pressure difference Azores-Iceland and Inner Asia-Iceland, the other two on gradient from southern foot of the Alps to British Isles. In Pt. 2 the connection with pressure distribution of preceding months is considered; Jan. and Feb. give some correlations above 0.5 with March temperature. The greater the pressure difference in Feb. between low and high latitudes in Europe, the greater is the E.–W. pressure gradient between inner Asia and the North Atlantic in March and so the higher the temperature in Germany. A regression equation is given. *Subject Headings:* **Long range forecasting, Correlations, Germany.**

2B–62 551.509.33:551.577

Beals, E. A., **Is it possible to predict California's rainfall several months in advance?** *American Meteorological Society, Bulletin,* 8:103–107, **1927. MH-BH**—A proposal for forecasting by Siberian winter anticyclone, its offshoots and tracks of depressions. *Subject Headings:* **Long range forecasting, California.**

2B–63 551.509.33:551.543.3

Berlage, H. P., Jr., **East-monsoon forecasting in Java.** *Indonesia,* (K.) *Magnetisch en Meteorologisch Observatorium te Batavia, Verhandelingen,* No. 20, **1927.** 42 p. figs., plate. **DWB. Further researches into the possibility of long-range forecasting in Netherlands India.** *Ibid.,* No.

26, 1934. 29 p. 17 figs., 6 tables, 43 refs. **DWB**—The first paper investigates the reasons for failures of Java monsoon forecasts by periodicities and develops a regression formula based on preceding pressures, temperatures and rainfalls in different parts of the world. Multiple correlations .86 in West Java, .81 in Central and .72 in East Java. Failures were due to sudden droughts at sunspot minimum. The second paper shows that this regression equation failed to answer expectations in subsequent years and discusses the whole question of seasonal forecasting by oscillations of pressure, ocean currents, symmetry and correlation. *Subject Headings:* **Long range forecasting, Correlations, Periodicities, Java.**

2B–64 551.509.33:517.512.2

†Brunt, David, **An investigation of periodicities in rainfall, pressure and temperature at certain European stations.** *Royal Meteorological Society, Quarterly Journal*, 53(221):1–25, Jan. 1927. 4 figs., tables. Discussion p. 25–30. fig. **MH-BH**—Forty-four periodicities from 12½ months to 35 years, found by harmonic analysis, are put forward as significant and compared with those found by other authorities (references cited). The effect of casual variations and "beats" in annual variation is discussed. Results not likely to be of practical forecasting value but a useful source of data on periodicities. *Subject Headings:* **Long range forecasting, Periodicities.**

2B–65 551.509.33:551.515

Hessling, N. A., **Variable features of barometric depressions and anticyclones as a basis for seasonal forecasting.** *Monthly Weather Review*, 55:184–186, 1927. 3 tables. **MH-BH**—Seasonal forecasts in Argentina are based on tendency of certain types of pressure distribution to occur frequently in some seasons, and on relation between mean latitude and tracks of depressions and anticyclones and rainfall in following season at Buenos Aires. High correlation (.67 to .85) found. *Subject Headings:* **Long range forecasting, Anticyclones, Depressions, Argentina.**

2B–66 551.509.33:551.590.23

Kamerling, Z., **Grondslagen voor een weervoorspelling op langen termijn. 1. Enkelvoudige perioden van wijziging der weergesteldheid.** [Principles of long range weather forecasting. 1. Simple periods in weather changes.] Leiden, 1927. 36 p. 15 figs., tables. **DWB**—Monthly rainfall of East Java is tabulated in synodic rotations of Venus, Mars, Jupiter, Saturn, Uranus. Other rainfall and temperature data are also considered. Remarkable agreements are found but no method of forecasting from them is described. *Subject Headings:* **Long range forecasting, Planetary influences, Java.**

2B–67 551.509.33:551.577.33

Petitjean, Lucien, **Sur une périodicité et une symétrie de la courbe des pluies à Alger. Application à la prévision des périodes sèches et pluvieuses en Algérie.** [On a periodicity and a symmetry of the rain curve at Algiers. Application to the forecasting of dry and rainy periods in Algeria.] *Académie des Sciences, Paris, Comptes-Rendus*, 185:472–473, 1927. **Sur la prévision des périodes sèches et pluvieuses en Algérie.** [On the forecasting of dry and rainy periods in Algeria.] *Ibid.*, 226:194–195, 1948. **DWB**—The first note describes periodicities of 6, 15 and 35 years in rainfall of Algiers, giving a symmetry point in 1903, from which rainfall is forecast up to 1975. The second note gives precise dates of maxima and minima; the next maximum is forecast for 1952. *Subject Headings:* **Long range forecasting, Periodicities, Symmetry points, Algeria.**

2B–68 551.509.33

Vize, V. IU., **Materialy dlia predskazaniia srednikh mesiachnykh i sezonnykh sostoianii meteorologicheskikh elementov. I. Sredniaia temperatura aprelia v Leningrade.** [Contributions to forecasting mean monthly and seasonal values of meteorological elements. I. Mean temperature of April at Leningrad.] *Zhurnal Geofiziki i Meteorologii*, 3:159–179, 1927. 8 figs., 8 tables. German summary p. 178–179. **DLC**—Forecasts by correlation with preceding data. For similar papers on forecasts for other months see *ibid.*, 4:39–63, 131–144, 289–297, 1927; 5:67–74, 1928; 6:53–67, 1929. German summaries p. 61–63, 143–144, 297; 74. *Subject Headings:* **Long range forecasting, Correlations, U.S.S.R.**

2B–69 551.509.33:551.543.4

Vize, V. IU., **Über mittlere monatliche Luftdruckanomalien.** [On mean monthly pressure anomalies.] *Annalen der Hydrographie und Maritimen Meteorologie*, 55:249–253, 1927. chart, 3 tables. **DWB**—Gives a number of correlation coefficients between mean monthly pressures of each of 12 months with following 12 months in Iceland, and temperature in Leningrad with preceding month in North America. Explained by four complete waves moving from W to E round the pole with a mean speed of 37.6° longitude per month. *Subject Headings:* **Long range forecasting, Correlations, Pressure waves.**

1928

2B–70 551.509.33:551.577.33

Bamford, A. J., **Seasonal correlation.** Colombo Observatory Report, **1927.** Append. p. (8)–(9), March 23, 1928. plate, S.W. monsoon correlation. **GB-MO**—Periodicities of 4.65 and 3.7 years in S.W. monsoon rainfall of stations on windward side of hills used to forecast rainfall for 1928. *Subject Headings:* **Long range forecasting, Periodicities, Ceylon.**

2B–71 551.509.33:551.513.7

Bliss, E. W., **Correlation of world weather and a formula for forecasting the height of the Parana River.** *Royal Meteorological Society, Memoirs,* 2(14):39–45, 1928. fig., 3 tables. **DWB**—St. Vincent temperature, S. Rhodesia rainfall, and height of Paraná are correlated with numerous other meteorological series. A formula for forecasting in Sept. height of Paraná Nov. to May is based on pressure at Darwin and Samoa. *Subject Headings:* **Long range forecasting, Correlations, South America.**

2B–72 551.509.33:551.311.181

Brooks, C. E. P. and Quennell, Winifred A., **The influence of Arctic ice on the subsequent distribution of pressure over the eastern North Atlantic and Western Europe.** *Great Britain, Meteorological Office, Geophysical Memoirs,* 5(41), **1928.** 36 p. 18 figs., 32 tables. **MH-BH.** Summary in *Meteorological Magazine, London,* 63:214–217, 1928; *Monthly Weather Review,* 56:416–417, 1928. Summary by ALFRED J. HENRY, *Monthly Weather Review,* 57:99–102, 1929. 2 figs., 2 tables, 8 refs. **MH-BH**—After a brief discussion of the oceanic circulation in the Arctic, authors correlate quarterly values of ice off Newfoundland, ice off Iceland, Stykkisholm temperature, ice in Greenland, Barents and Kara Seas, Jan Mayen and Siberian temperature and various pressure gradients with quarterly mean pressures at 9 stations in Northeast Atlantic and West Europe with lags of 0–48 months. From the results equations are constructed for forecasting pressure distribution in Nov.–Jan. An "index of Arctic ice" is constructed and annual values tabulated; these show interesting relations with pressure variations for next 4 years. *Subject Headings:* **Long range forecasting, Polar ice, Correlations.**

2B–73 551.509.33

Brooks, C. E. P. and Quennell, Winifred A., **The relations between the Nile flood and subsequent pressures over the eastern North Atlantic and Western Europe.** *Royal Meteorological Society, Quarterly Journal,* 54:262–267, **1928.** fig., 3 tables, 2 refs. **MH-BH**—Correlation coefficients are given between Nile flood and pressure at Cairo and subsequent pressure anomalies at stations in European-Atlantic region. A number of significant coefficients are found, which are attributed to a common origin in variations of atmospheric circulation. *Subject Headings:* **Long range forecasting, Correlations, Nile flood.**

2B–74 551.509.33

Groissmayr, Fritz Béla, **Beitrag zur Langfrist-Wettervorhersage.** [Contribution to long range forecasting.] *Annalen der Hydrographie und Maritimen Meteorologie,* 56:287–293, **1928.** **DWB**—Author found a correlation of −.66 between annual rainfall at Charleston, S. C. and winter pressure difference Azores–Iceland 2½ years later. *Subject Headings:* **Long range forecasting, Correlations.**

2B–75 551.509.33:551.513.7

Groissmayr, Fritz Béla, **Neue Vorhersagemöglichkeiten der Wintertemperatur Deutschlands.** [New possibilities of forecasting the temperature of Germany.] *Zeitschrift für angewandte Meteorologie,* 45:233–241, **1928.** **DWB**—Quotes some large correlation coefficients between winter temperature in Germany and preceding conditions in other parts of the world, and gives a regression equation with a multiple correlation of about 0.8. (*See item* 2B–78.) *Subject Headings:* **Long range forecasting, Correlations, Germany.**

2B–76 551.509.33

Sampaio Ferraz, J. de, **A previsão de tempo a longo prazo. Methodo racional—correlações—periodicidades. Notas sobre formulas recentes para a previsão das sêccas do Ceará, e das chuvas da bacio do Prata, interessando o Estado de São Paulo.** [Long range forecasting. Rational methods—correlations—periodicities. Note on recent formulas for forecasting Ceará droughts, and rains in the Prata, affecting the State of São Paulo.] Rio de Janeiro, Directoria de Meteorología, **1928.** 19 p. **DWB**—*Subject Headings:* **Long range forecasting, Brazil.**

2B–77 551.543.3

von Schubert, O., **Die dreijährige Luftdruckwelle. Darstellung ihres Verlaufes auf der ganzen Erdoberfläche.** [The three-year pressure wave. Exposition of its course over the whole earth.]

Leipzig, Universität, Geophysikalisches Institut, Veröffentlichungen, 2nd Ser., 3(6):337–368, **1928.** 5 figs., 11 charts, 3 tables, 19 refs. **DWB**—The 3-year wave is shown to proceed N and S from equatorial regions and affects higher latitudes chiefly in well-developed action centers. Each hemisphere has a complete zonal standing wave, which is regarded as due to natural rhythmic oscillations of the atmospheric circulation set up by an initial temperature departure in low latitudes. *Subject Headings:* **Long range forecasting, Periodicities.**

2B–78 551.509.33:519.2

Wagner, A., **Über die Benutzung der Korrelationsfaktoren zu langfristigen Prognosen.** [On the use of correlation coefficients in long range forecasts.] *Zeitschrift für angewandte Meteorologie*, 45:199–205, **1928.** **DWB**—Author examines several high correlation coefficients between conditions in different parts of the world, with a time lag, apparently suitable for long range forecasting, and shows that in many cases they result simply from parallel or opposed secular trend or deviations of the atmospheric circulation. Coefficients with no apparent physical cause should not be used for forecasting but only as starting points for further investigations. Large regions, not single points, should be used. *Subject Headings:* **Long range forecasting, Correlations.**

2B–79 551.509.33:551.513.7

Walker, Sir Gilbert, **World weather.** *Royal Meteorological Society, Quarterly Journal*, 54(226): 79–87, April **1928.** 6 figs., 7 refs. **MH-BH.** Summary in *Monthly Weather Review*, 56:167–170, **1928.** 4 figs. **MH-BH**—An account of WALKER's three "oscillations," North Atlantic, North Pacific and Southern; their effects on weather and their use in seasonal forecasting (illustrated by Ceará rainfall and Indian monsoon). *Subject Headings:* **Long range forecasting, Atmospheric circulation, Centers of action.**

2B–80 551.509.33:551.513.7

*Walker, Sir Gilbert and Bliss, E. W., **World weather III.** *Royal Meteorological Society, Memoirs*, 2(17):97–134, **1928.** 6 tables. **DWB**—Seasonal values of pressure, temperature, rainfall, etc. at 32 centers are correlated with each other in the same season and in one and two seasons before and after. The results should be of value in suggesting methods of search for seasonal forecasting formulas. A table of probable largest of m coefficients is used to test reality. The Southern, North Atlantic and North Pacific oscillations are discussed. *Subject Headings:* **Long range forecasting, Centers of action, Correlations.**

1929

2B–81 551.509.33:551.513.7

Groissmayr, Fritz Béla, **De invloed der weersgesteldheid in Egypte in den zomer op den volgenden winter in Nederland.** [The influence of the state of the weather in Egypt in summer on the following winter in Holland.] *Hemel en Dampkring*, 27:87–89, **1929.** table, 5 refs. Note by C. BRAAK p. 89–90. **DWB**—Gives correlation coefficients of .5 between Nile flood at Assuan July–Oct. and pressure at Cairo March–Aug. with following winter temperature at De Bilt, 1869–1920. BRAAK compared observed and calculated temperatures 1921–1928 and found no agreement. *Subject Headings:* **Long range forecasting, Correlations, Netherlands.**

2B–82 551.509.33:551.579.4

Groissmayr, Fritz Béla, **Nilflutvorhersage.** [Nile flood forecasts.] *Meteorologische Zeitschrift*, 46:259–263, **1929.** fig., tables. **DWB**—Gives correlation coefficients and a regression equation for forecasting Nile flood from 5 distant stations up to 2 years earlier, and verification. Total correlation .83, probability of success 97%. *Subject Headings:* **Long range forecasting, Correlations, Nile flood.**

2B–83 551.509.33:551.577.33

Hunt, H. A., **A basis for seasonal forecasting in Australia.** *Royal Meteorological Society, Quarterly Journal*, 55(232):323–329, Oct. **1929.** fig., tables. Discussion p. 330–334. **MH-BH**—Author found a 4-year periodicity in rainfall of Australia, attributed to a local cycle of insolation, monsoonal variations and growth of grasses. Supported by high negative correlations between rainfall and temperature at different intervals. In the discussion it was suggested that two periodicities of 3.7 and about 4½ years were involved and that these were due to cosmical causes and/or world oscillations superposed on local conditions. *Subject Headings:* **Long range forecasting, Periodicities, Australia.**

2B–84 551.509.33:551.577.38

Lir, E. S., **Materials for a synoptical study of droughts in east Europe.** *Zhurnal Geofiziki i Meteorologii*, 6:103–125, **1929.** 12 figs. [In English. Russian summary entitled: Materialy dlia

sinopticheskogo izucheniia zasukh vostochnoi evropy.] **DLC**—A study of anticyclones and their tracks with a view to forecasting summer droughts. The method adopted is to study "streams" of air and their periodic displacement and return. Three streams are recognized—polar, east and equatorial. Most polar outbreaks from the NW recurred after 7 months, but in the interval there are considerable changes, especially in the important effects originating in northeastern Europe. The results were not yet suitable for forecasting. *Subject Headings:* **Long range forecasting, Anticyclones, Drought, U.S.S.R.**

2B–85 551.509.33:551.577

Quayle, E. T., **Long range rainfall forecasting from tropical (Darwin) air pressures.** *Royal Society of Victoria, Melbourne, Proceedings*, New Ser., 41:160–164, **1929.** 2 figs. **DWB**—Darwin, North Australia, air pressures June–July have a correlation of −.81 with rainfall over northern Victoria in Aug.–Sept. Forecasts based on this would have been correct on 82% of occasions. *Subject Headings:* **Long range forecasting, Correlations, Australia.**

2B–86 551.509.33

Richard, W., **Wetter und Verkehrswesen.** [Weather and traffic.] *Reichsbahn*, 5(37, 38, 39): 679–684, 700–703, 716–719, **1929.** figs., tables refs. **DWB**—From 89- and 35-year cycles author prognosticates that 1930–1960 will bring a shortage of water and very severe winters in Germany. Baur, Franz, **Bemerkungen zur W. Richards Witterungsvorhersage für die Jahrzehnte 1930–1960.** [Remarks on W. Richard's weather forecast for the decades 1930–1960.] *Meteorologische Zeitschrift*, 48:152–154, 1931, points out that Richard does not discuss the reality of his periodicities and after considering the evidence, concludes that there is no basis for the forecasts. *Subject Headings:* **Long range forecasting, Periodicities, Germany.**

2B–87 551.524.33

†Rietschel, Ernst, **Die 3–3½jährige und die 2jährige Temperaturschwankung.** [The 3–3½-year and 2-year temperature oscillation.] *Leipzig, Universität, Geophysikalisches Institut, Veröffentlichungen, Ser. 2*, 4(1):1–48, **1929.** 10 figs., 23 charts, 2 tables, biblio. p. 46–47 (51 items). **DWB**—On the basis of the double symmetry point of 1895–1896 in the wheat crops of eastern England (Shaw, 1923) two periodic oscillations are recognized in temperatures 1901–1912, and their distribution over the world studied. One is a 3-year natural oscillation converted to about 3½ years by external impulses. The other is a spatially very uniform oscillation of 2.2 years. *Subject Headings:* **Long range forecasting, Periodicities.**

2B–88 551.509.33:551.513.7

Sampaio Ferraz, J. de, **A previsão das sêccas do nordeste. Ensaios pelo methodo de correlações.** [Forecasting the droughts of northeast Brazil. Attempts by the method of correlation.] Rio de Janeiro, Directoria de Meteorología, **1929.** 12 p. **DWB**—A discussion of a regression equation for seasonal rainfall of Ceará (multiple correlation .82) given by Sir Gilbert Walker and possible improvements on it. *Subject Headings:* **Long range forecasting, Correlations, Brazil.**

2B–89 551.509.33:551.513.7

Stein, R., **Beziehungen von Luftdruckanomalien auf der Erde zueinander im Sommer der Nordhalbkugel.** [Relations of pressure anomalies on the earth one to another in the summer of the Northern Hemisphere.] *Meteorologische Zeitschrift*, 46:209–217, **1929.** 14 figs., 2 tables. **MH-BH**—World charts show pressure deviations corresponding to pressure differences of a number of pairs of distant stations. Author finds three important circulation systems: North Atlantic—Eurasian, North Pacific—North American, Southern Oscillation. No explanation is attempted but the results are put forward as a basis for statistical forecasting. *Subject Headings:* **Long range forecasting, Atmospheric circulation, Pressure anomalies.**

2B–90 551.509.33:551.577

Unakar, Mukund V., **Correlations between pre-monsoon conditions over North-West India and subsequent monsoon rainfall over North-West India and the Peninsula.** *India, Meteorological Dept., Scientific Notes*, Poona, 1(6):57–67, **1929.** 12 tables. **DWB**—Factors used in correlation coefficients with rainfall in June–Sept.: Himalayan snow accumulation at end of May, March rainfall over northwest India, Ganges River discharge in May. These gave a multiple correlation of .59 (.66 for July and Aug.); coefficients with Peninsula rain were smaller. *Subject Headings:* **Long range forecasting, Correlations, India.**

2B–91 551.509.33:551.509.22

Wagner, A., **Eine Anregung zur internationalen Förderung der langfristigen Wetterprognose.** [A stimulus to the international advancement of long range weather forecasting.] *Meteorologische*

Zeitschrift, 46:315–318, 1929. **MH-BH**—Correlation method leads to understanding of oscillations of atmospheric circulation. These must be linked with individual weather elements. Author advocated broadcasting of monthly, as well as daily data. This proposal ultimately led to CLIMAT broadcasts. *Subject Headings:* **Long range forecasting, Correlations, CLIMAT broadcasts.**

1930

2B–92 551.509.33:551.513.7

Baur, Franz, **Der gegenwärtige Stand der meteorologischen Korrelationsforschung.** [The present state of meteorological correlation investigation.] *Meteorologische Zeitschrift*, 47:42–52, **1930.** 5 figs., 3 tables. **MH-BH**—Discusses correlation coefficients between contemporary and successive general weather conditions in different parts of the world, referring especially to the work of WALKER on oscillations. Then discusses correlation of quarterly means of pressure, temperature and rainfall with sunspots; coefficients are mostly small. Apparent relations hitherto published between successive months are unstable. Progress requires "synthesis of theoretical-deductive and mathematical-statistical methods" and author attempts this by correlating change of pressure difference Azores-Iceland and of pressure at Iceland with subsequent pressure and temperature differences between pairs of stations. Not of immediate practical value but a contribution to the understanding of the problem. *Subject Headings:* **Long range forecasting, Correlations.**

2B–93 551.509.33:551.513.7

Blair, Thomas A., **Summer and autumn pressure anomalies affecting winter temperatures in the upper Mississippi Valley.** *Monthly Weather Review*, 58:53–58, **1930. DWB.** Summary in *American Meteorological Society, Bulletin*, 11:79–80, 1930. 12 figs. **DWB**—Gives Northern Hemisphere charts of average pressure anomalies for summers and autumns preceding cold and warm winters, and for the winters themselves, and 18 charts of individual seasons. Finds correlations with summer pressures in Honolulu and Alaska, but with exceptions. Further research would be justified. *Subject Headings:* **Long range forecasting, Correlations, Pressure anomalies, Mississippi Valley.**

2B–94 551.509.33:551.513.7

Bliss, E. W., **A study of rainfall in the West Indies.** *Royal Meteorological Society, Quarterly Journal*, 56(233):67–72, Jan. **1930.** fig., 4 tables. Note by C. E. P. BROOKS p. 178–179. **MH-BH**—A regression equation for rainfall of eastern islands of West Indies June–Dec. is based on preceding pressure in Central Siberia, Azores and Charleston and temperature of St. Vincent. Multiple correlation .69. BROOKS traced cause of relation to transmission of temperature variations along North Equatorial Current (increase of surface temperature by 1°F. increases June–Dec. rainfall by 6 inches). *Subject Headings:* **Long range forecasting, Correlations, West Indies.**

2B–95 551.509.33:551.311.181:551.465

Brooks, C. E. P., **The rôle of the oceans in the weather of western Europe.** *Royal Meteorological Society, Quarterly Journal*, 56(234):131–140, April **1930.** 2 figs. **MH-BH**—Summarizes briefly author's work on correlation of pressure anomalies in the European-Atlantic region with preceding variations of Atlantic trade winds and ice conditions in the Arctic. The results are tentatively explained from the physical viewpoint. *Subject Headings:* **Long range forecasting, Correlations, Polar ice, Ocean currents.**

2B–96 551.509.33:551.577.3

Gorton, A. F., **Forecasting seasonal precipitation in California: its relation to electric power production.** Presented at Pacific Coast Convention of the American Institution of Electrical Engineering, Portland, Oregon, Sept. 2–5, **1930.** 6 p. tables, diagrs. **DWB**—Forecast of rainfall of California over periods of years can be based on periodicities of 2–3, 5–6, 20–26 and 50–60 years. Seasonal forecasts based on sea temperature at inshore stations have been successful and other indexes are possible, such as preceding temperature in Japan and surface temperature in Gulf of Alaska. A list of 17 promising correlation coefficients ranging up to .84 is given. *Subject Headings:* **Long range forecasting, Correlations, Periodicities, California.**

2B–97 551.509.33:551.515.7

Tikhomirov, E. I., **Desiat' let reguliarnykh dolgosrochnykh prognozov pogody.** [Ten years of regular long range forecasts.] *Glavnaia Geofizicheskaia Observatoriia, Izvestiia*, (3–4):1–10, **1930–1931.** 2 figs., photo of Multanovskiĭ. English summary p. 10. **DWB**—Gives a concise summary of B. P. MULTANOVSKIĬ's methods based on classification of areas of origin and trajectories of pressure maximums, and a series of forecasts issued during the 10 years. MULTANOVSKIĬ's methods are

compared with those of C. E. P. Brooks and H. A. Hessling. *Subject Headings:* **Long range forecasting, Anticyclones, B. P. Multanovskiĭ.**

2B–98 551.509.33:551.590.2

Tippenhauer, Louis Gentil, **La prévision du temps: 1) Le temps peut être précalculé. 2) La loi du temps. 3) La théorie électro-magnétique et les taches solaires. 4) Considérations sur les principes fondamentaux du précalcul astronomique journalier du temps. Append.) Le procédé du précalcul astronomique du temps.** [Weather forecasting: 1) The weather can be forecast. 2) Weather laws. 3) Electromagnetic theory and sunspots. 4) Considerations on fundamental principles of astronomical, daily weather forecasts. Append.) Procedure of astronomical weather forecasting.] *Port-au-Prince, Observatoire Météorologique, Bulletin Annuel,* **1930.** p. 69–83. Supplement with 13 diagrs. **DWB**—An account of author's method of astronomical precalculation of daily weather. (*See item* 2B–134.) *Subject Headings:* **Long range forecasting, Planetary influences.**

2B–99 551.509.33:551.513.7

Unakar, Mukund V., **The association of the mid-monsoon Indian rainfall with pressure distribution over the globe.** *India, Meteorological Dept., Scientific Notes,* Poona, 2(12):13–19, **1930.** 4 plates, 4 tables. **DWB**—Correlation coefficients are given between July and August rainfall in Peninsula, northwest and northeast India and 40 contemporary pressures or pressure gradients. Results are shown on charts. Distribution of coefficients is significant for Peninsula (.6–.8) and northwest India (.6) but not for northeast India. *Subject Headings:* **Long range forecasting, Correlations, India.**

2B–100 551.509.33:551.526.6

Vize, V. IU., **Der Einfluss der Wassertemperatur im Barents-Meer auf die Lufttemperatur in Nord-Europa.** [The influence of the water temperature in the Barents Sea on the air temperature in North Europe.] *Annalen der Hydrographie und Maritimen Meteorologie,* 58:207–212, **1930.** 5 figs. **DWB**—Author gives a number of high positive correlation coefficients between temperature of surface water in Barents Sea July–Sept. and synchronous and subsequent air temperature, the latter because sea temperature has great persistence. This can be used for forecasting summer and autumn temperatures in northwestern Europe; a regression equation is given for Vardo. *Subject Headings:* **Long range forecasting, Correlations, Sea temperatures.**

2B–101 551.509.33:551.513.7

Walker, Sir Gilbert, **Seasonal foreshadowing.** *Royal Meteorological Society, Quarterly Journal,* 56(237):359–364, Oct. **1930.** 5 figs. **MH-BH**—A brief account of results of regression equations for forecasting rainfall of Australia and South Africa and temperature of Cape Town, Southwest Canada and Darwin. It is recommended that forecasts be issued only when probability is that sign of deviation will be correct 4 times in 5. *Subject Headings:* **Long range forecasting, Correlations.**

2B–102 551.509.33:551.513.7

Walker, Sir Gilbert and Bliss, E. W., **World weather IV. Some applications to seasonal foreshadowing.** *Royal Meteorological Society, Memoirs,* 3(24):81–95, Feb. **1930.** .4 figs., tables. **DWB**—The term "foreshadowing" is introduced as less ambitious than "forecasting." Regression formulas are developed for winter temperature of western Canada (multiple coefficient .71), Dawson (.72), summer rain of South Africa except Natal (.72) and summer rain of north and northeast Australia (.79). *Subject Headings:* **Long range forecasting, Correlations.**

1931

2B–103 551.509.33:551.577.33

Alter, Dinsmore, **The success of the tests of the long-range predictions of British rainfall.** *Royal Meteorological Society, Quarterly Journal,* 57(239):198–201, April **1931.** 2 figs. **MH-BH**—In *Monthly Weather Review,* June 1927 author published forecasts of British rainfall for 11 seasons based on a correlogram. Correlation with observed rainfall +.61. *Subject Headings:* **Long range forecasting, Forecast verification, Periodicities, British Isles.**

2B–104 551.509.33:551.577.38

Grunow, J., **Über die Ursachen grosser Trockenheit in Mitteleuropa.** [On the causes of great drought in central Europe.] *Berlin, (K.) Preussisches Meteorologisches Institut, Abhandlungen,* 9(8), **1931.** 31 p. 48 charts, 10 tables. **DWB**—Severe droughts in central Europe are classified according to the accompanying pressure distribution into 4 types, 1–2 marked by anticyclones over

central or eastern Europe, 3–4 by ridges from Azores or North Atlantic to central Europe. Stages of pressure development before and during the droughts are examined and classified into polar and Azores advances. *Subject Headings:* **Long range forecasting, Anticyclones, Drought, Europe.**

2B–105 551.509.33:551.513.7

Iyer, V. Doraiswamy, **Rainfall of Siam; its normal distribution and relation to Indian rainfall; possibility of forecasting monsoon rains.** *India, Meteorological Dept., Scientific Notes*, Poona, 4(38):69–85, **1931.** 9 figs., map, 4 tables. **DWB**—From correlation coefficients between rainfall of Upper Siam June–Sept. and preceding pressures in South America and Central Siberia, snow in Himalayas and temperature in Dutch Harbor, a forecasting formula is calculated with a multiple correlation of .81. *Subject Headings:* **Long range forecasting, Correlations, Siam.**

2B–106 551.509.33:551.590.2

Jones, Inigo, **Seasonal forecasting.** Brisbane, **1931.** 10 p. **DWB.** Review: **Sunspots, planets and weather.** *Nature, London*, 130:31–32, 1932. **DWB**—Explanations of abnormal weather in Australia are sought in sunspots and conjunctions of the planets. *Subject Headings:* **Long range forecasting, Planetary influences, Sunspots, Australia.**

2B–107 551.543.4:523.74

Peppler, Albert, **Energieschwankungen der nordatlantischen Zirkulation and Sonnenflecken 1881–1923.** [Energy oscillations of the North Atlantic circulation and sunspots 1881–1923.] *Beiträge zur Geophysik*, 29:187–200, **1931. DWB**—Defant's data (1924) of meridional pressure gradient in North Atlantic are brought up to 1923. Persistence effect small. A 22-year cycle is found. *Subject Headings:* **Long range forecasting, Atmospheric circulation, Persistence, Sunspots, North Atlantic.**

2B–108 551.509.33:551.465

Sandström, J. W., **Der Golfstrom und das Wetter.** [The Gulf Stream and the weather.] *Beiträge zur Geophysik*, 32:254–259, **1931. DWB. The Gulf Stream and the weather.** *Arkiv för Matematik, Astronomi och Fysik*, 30A(18):1–12, 1944. 9 figs. **DWB**—A discussion of long term forecasts from the Gulf Stream. The southern part has no influence on weather. If the northern part is warm, winter will be warm in Europe and cold in Greenland. Direction of the Gulf Stream is of fundamental importance; action takes place through the pressure distribution. *Subject Headings:* **Long range forecasting, Gulf Stream.**

2B–109 551.509.33:519.2

Savur, S. R., **The seasonal forecasting formulae used in the India Meteorological Department.** *India, Meteorological Dept., Scientific Notes*, Poona, 4(37):57–68, **1931.** fig., 11 tables, 12 refs. **DWB**—The significance of various seasonal forecasting formulas used in the India Meteorological Department is examined using Fisher's 5% tables. Out of 28 relations, it is found that only 7 proved likely to become insignificant in course of time and are not worth retaining. An example of testing regression equations used for forecasting. *Subject Headings:* **Long range forecasting, Correlations, India.**

2B–110 551.509.33:551.509.8

von Myrbach, O., **Eine wohlgelungene Langfristvoraussage.** [A very successful long range forecast.] *Zeitschrift für angewandte Meteorologie*, 48:279–283, **1931.** 2 tables. **DWB**—Calls attention to a forecast published by a gardener in Nov. 1930 in Berlin, based on behavior of animals and plants, that winter of 1930–1931 would be mild and snowy. This proved completely accurate. *Subject Headings:* **Long range forecasting, Weather lore.**

2B–111 551.590.33:551.578.46

Weightman, R. Hanson, **Snow cover in southern Canada as related to temperatures in the North Atlantic States and the Lake Region.** *Monthly Weather Review*, 59:383–386, **1931.** 14 charts, table. **DWB**—March snow cover over southern Canada is one, but not the main factor in April temperatures in the northern United States border states. *Subject Headings:* **Long range forecasting, Snow cover, North America.**

1932

2B–112 551.509.33:551.311.181

Brooks, C. E. P., **The influence of the ice in Davis Strait on the weather of the British Isles.** *Meteorological Magazine, London*, 67(799):153–156, Aug. **1932.** 2 figs. **DWB**—Correlation coefficients given between severity of ice conditions in Davis Strait and subsequent seasonal pressures in western Europe, Iceland and Azores. Much ice is followed in Aug.–Oct. of following year by high

pressure over British Isles. *Subject Headings:* **Long range forecasting, Polar ice, Correlations, British Isles.**

2B–113 551.509.33:551.526.6

Gorton, A. F., **A study of the interrelation between air-temperatures in California and ocean-temperatures in the north-east Pacific and its influence in long-range forecasting.** *American Geophysical Union, Transactions,* 1932. p. 128–131. fig. **DWB**—Moving 12-month sums of ocean temperatures at La Jolla and air temperatures at San Diego and other places show close agreement. The probable trend of temperature is a necessary basis for forecasts of precipitation. *Subject Headings:* **Long range forecasting, Sea temperatures, California.**

2B–114 551.509.33:519.2

Savur, S. R. and Rao, S. Gopal, **Tables extending Walker's criteria for finding the chance of success of a forecast.** *India, Meteorological Dept., Scientific Notes,* Poona, 5(49):31–39, **1932.** 2 tables. **DWB**—In *India, Meteorological Dept., Memoirs,* Poona, 21(9):13–15, 1914, G. T. WALKER published tables for picking out significant correlation coefficients or periodicities. These are extended. Table I gives 50% and 5% values of greatest of M accidental correlation coefficients and periodicities, $M=2$ to 1000. Table II gives probability that unpredictable part of an element forecast does not fall below a given value for various correlations. Useful for checking significance of forecasting formulas. *Subject Headings:* **Long range forecasting, Correlations, Forecast verification.**

2B–115 551.509.33:551.513.7

Sellick, N. P., **Seasonal foreshadowing by correlation.** *Royal Meteorological Society, Quarterly Journal,* 58(245):226–228, July **1932.** 2 tables. **DWB**—Shows that many of the high correlations used in foreshadowing disappear when additional data are analyzed, the frequency distribution of the changes not differing much from that of random series treated in the same way. Recommends tabulating errors of regression equation forecasts to use in the search for additional factors. *Subject Headings:* **Long range forecasting, Correlations, Forecast verification.**

2B–116 551.509.33:551.513.7

Walker, Sir Gilbert and Bliss, E. W., **World weather, V.** *Royal Meteorological Society, Memoirs,* 4(36):53–84, Oct. **1932.** 19 charts, 11 tables. **DWB**—Defines the "North Atlantic," "North Pacific" and "Southern" Oscillations more closely from seasonal pressures and temperatures at various stations and gives correlations with weather in subsequent seasons. *Subject Headings:* **Long range forecasting, Atmospheric circulation, Correlations.**

1933

2B–117 551.577.33

Alter, Dinsmore, **Some results of cycle analysis of rainfall.** *American Meteorological Society, Bulletin,* 14:256–257, **1933.** **MH-BH**—Discussion of papers by ALTER on analysis of rainfall in England and E. J. PROUSE on Oregon and Washington. Quarterly records of rainfall in England 1727–1929 showed no strictly periodic terms but one or more cycles in step with sunspot numbers. Of little use for forecasting. PROUSE found periodicities of 1.40 and 11.20 years. *Subject Headings:* **Long range forecasting, Periodicities.**

2B–118 551.509.33:551.543.3

Berlage, H. P., Jr., **Über die Verbreitung der dreijährigen Luftdruckschwankung über die Erdoberfläche und den Sitz des Umsteurungsmechanismus.** [On the distribution of the three-year pressure oscillation over the earth's surface and the seat of the steering mechanism.] *Meteorologische Zeitschrift,* 50:41–47, **1933.** **DWB**—With high pressure on poleward side of low pressure an automatic cycle of pressure and temperature develops. This occurs between Icelandic Low and polar cap, natural period 76 months, in northeast trade-equatorial low (22 months) and Malay region (28 months). Seasonal influences prolong these to 7, 2 and 3 years, modified by interference between different cycles. *Subject Headings:* **Long range forecasting, Periodicities.**

2B–119 551.509.33:551.509.318

Bullig, H. J., **Über die Aufeinanderfolge typischer Grosswetterlagen und ihre Verwendbarkeit für langfristige Wettervorhersagen.** [On the succession of typical general weather types and their applicability for long range forecasting.] *Meteorologische Zeitschrift,* 50:470–472, **1933.** 8 refs. **DWB**—Author found that deviation of monthly frequency of Föhn in Alpine valleys Sept.–March is a good index of monthly pressure anomalies over Europe and North Atlantic. He also found that

succession of general weather types north, northeast, south, southwest in a succession of months occurs in most cases. Verified Oct. 1932 through Feb. 1933. Cause lies outside troposphere. *Subject Headings:* **Long range forecasting, Weather types.**

2B–120 551.509.33

Multanovskiĭ, B. P., **Osnovnye polozheniia sinopticheskogo metoda dolgosrochnykh prognozov pogody Chast' 1. (Tekst).** [Basic principles of the synoptic method of long range weather forecasting. Pt. 1, (Text)] *SSSR, Glavnoe Upravlenie, Gidrometeorologicheskoĭ Sluzhby,* **1933.** 139 p. **DWB**—A description of the author's method of forecasting by axes, polar and ultrapolar trajectories, etc. [English translation available.] *Subject Headings:* **Long range forecasting, Air masses, U.S.S.R.**

2B–121 551.509.33

Reed, Charles D., **Persistent weather abnormality.** *Monthly Weather Review,* 61:109–112, April **1933.** 7 figs. **DWB**—Examples of persistence from one month to the next. Diagrams give probabilities for: temperature June–July in Illinois and Iowa, Jan.–Feb. in Iowa and Wisconsin, May–June in Illinois, precipitation June–July and May–June in Iowa. Agricultural application mentioned. *Subject Headings:* **Long range forecasting, Persistence, United States.**

2B–122 551.509.33:551.513.7

Walker, Sir Gilbert T., **Seasonal weather and its prediction.** *British Association for the Advancement of Science, Report* **1933.** p. 25–44. *Smithsonian Institution Annual Report* 1935:117–138. **1936.** 14 figs. **DWB**—After a brief historical introduction and note on correlation, gives world charts of isocorrelates of pressure, temperature and rainfall with North Atlantic, North Pacific and Southern Oscillations. Illustrations of seasonal predictions by correlations are: rainfall of northeast Australia, Peninsula and northwest India, south Rhodesia; number of icebergs in Atlantic; Cape Town temperature. *Subject Headings:* **Long range forecasting, Correlations.**

2B–123 551.509.33

Wasserfall, K. F., **Praktische Versuche mit langsichtigen Wettervoraussagen I, II.** [Practical essays in long range weather forecasting.] *Meteorologische Zeitschrift,* 50:331–337, **1933;** 51:31–35, 1934. 8 figs., 2 tables. **DWB**—In long temperature series in Norway, author finds periodicities of 236 days and 11 years. These appear also in sunspot numbers. A 2-year wave is clearly shown, persisting for 15 years and then reversing phase. This is due to interaction of annual and 236-day periods. Successful seasonal forecasts 3 months ahead for 4 years were based on these but phase reversals could not be foreseen. In Pt. II the 27 and 13½ day solar rotation periods (formerly considered lunar) are introduced; these also change phase at irregular intervals. Good agreement between synthesized curve and smoothed daily observations 1929–30. A forecast was published on Dec. 20, 1930 and was partly successful. *Subject Headings:* **Long range forecasting, Periodicities.**

1934

2B–124 551.509.33:551.465

Brooks, Charles F. and Harwood, E. Monroe, **A preliminary comparison of monthly weather with ocean temperature sequences in the western Atlantic region.** *American Geophysical Union, Transactions,* **1934:211–214.** fig., 2 tables. **DWB**—Monthly departures of air temperature and precipitation at Boston and Baltimore are compared with sea temperatures in zones of Gulf Stream for the month before. Low sea temperature was followed by high air temperature and high precipitation. Further investigation desirable. *Subject Headings:* **Long range forecasting, Gulf Stream, Sea temperatures.**

2B–125 551.509.33

Chrétien, Henri, **Les méthodes de prévision du temps à courte et à longue échéance.** [Short and long range weather forecasting methods.] Paris (Charles-Lavauzelle) **1934.** 436 p. **GB-MO**—This is a popular general work on forecasting and effect of weather on man. Chap. 6, "Forecasting of distant weather" includes forecasting by sun and magnetic storms, and by the moon; influence of planets, comets, etc.; singularities; Brückner cycle and Abbé Gabriel's method of lunar-solar cycles. No reference to recent ideas. *Subject Headings:* **Long range forecasting, Periodicities, Planetary influences.**

2B–126 551.513.7:551.577.3

Höhn, Rudolf, **Über die Ursache der Niederschlagsschwankungen in Europa und ihre Beziehungen zu anderen meteorologischen Faktoren.** [On the causes of variations of rainfall in Europe and their relations to other meteorological factors.] Inaug.-Diss. Universität Leipzig, **1934.** 64 p.

13 figs., 13 charts, 11 tables, 32 refs. German summary p. 45–46. **DWB**—Seasonal and annual relations between American temperature and European rainfall discussed statistically and synoptically. The relation is attributed to oscillations of the atmospheric circulation. Many of the correlation coefficients originally given are incorrect; a correction sheet was issued later. *Subject Headings:* **Long range forecasting, Atmospheric circulation, Correlations.**

2B–127 **551.509.33**

McEwen, George F., **Methods of seasonal weather forecasting at the Scripps Institution of Oceanography.** *American Meteorological Society, Bulletin*, 15:249–256, Nov. **1934.** tables. **MH-BH**—Lists regression equations for forecasting seasonal rainfall of districts of California and Oregon, based on summer minus winter temperature and various cycles. Similar forecasts of temperature are briefly discussed. *Subject Headings:* **Long range forecasting, Correlations, Oregon, California.**

2B–128 **551.509.33:551.578.46**

Monson, O. W., **The snow survey as an index to summer precipitation.** *Monthly Weather Review*, 62:322–330, Sept. **1934.** 14 figs. **DWB**—Rainfall in Montana, April through August, shows a correlation of +.7 with water content of snow in Swiftcurrent Basin early in May. Estimates from regression equations gave good results. *Subject Headings:* **Long range forecasting, Correlations, Snow cover.**

2B–129 **551.509.33:551.513.7**

Treloar, H. M., **Foreshadowing monsoonal rains in Northern Australia.** *Australia, Bureau of Meteorology, Bulletin*, No. 18, **1934.** 29 p. 5 figs., 11 tables. **DWB**—Regression formulas are derived for foreshadowing monsoon rains in 3 districts, based on preceding pressures at Darwin, Honolulu and Santiago+Buenos Aires. Multiple correlations are .71, .51 and .57. A test over 11 years (not used in formula) was satisfactory so far as it went, but limits of prediction are rather wide. *Subject Headings:* **Long range forecasting, Correlations, Australia.**

2B–130 **551.509.33:551.513.7**

Tu, Chang-wang, **China rainfall and world weather.** *Royal Meteorological Society, Memoirs*, 4(38):99–117, Feb. **1934. DWB.** 12 maps, 6 tables. Summary and discussion in *Quarterly Journal*, 60(254):167–168, April 1934. **DWB**—Regression equations are calculated for rainfall of 4 regions of China. Increased Southern Oscillation is found to give heavy rainfall. Multiple correlations .62 to .78. *Subject Headings:* **Long range forecasting, Correlations, China.**

1935

2B–131 **551.509.33:523.2**

Abbot, Charles Greeley, **Solar radiation and weather studies.** *Smithsonian Miscellaneous Collections*, 94(10), **1935.** 89 p. 38 figs., 13 tables. **DWB**—A periodogram investigation of 15 years' data found periodicities of solar radiation of 7, 8, 9¾, 11, 21, 25, 34, 39½, 46 and 68 months, all sub-multiples of 23 years. Similar periodicities occur in long series of temperatures but phase changes by 180° at intervals, which are integral multiples of 11½ years measured from Jan. 1819. Forecasts of temperature and pressure based on these were issued for 1934 to 1936 for U.S.A. and verified fairly well for 1934. *Subject Headings:* **Long range forecasting, Periodicities, Solar constant.**

2B–132 **551.509.33:551.513.7**

Okada, Takematsu and Yamada, T., **On the forecast of the north-east monsoon in Formosa.** *Geophysical Magazine, Tokyo*, 8:295–304, **1935.** 4 figs., 6 tables. **DWB**—Gives correlation coefficients between date of burst of northeast monsoon in Pescadores, Formosa, and Hsingking temperature June–July, differences of frequencies of west and east winds at Mukden March–April, difference of pressure at Yinkow and Hsingking May–June and Palau pressure May. *Subject Headings:* **Long range forecasting, Correlations, Formosa.**

2B–133 **551.509.33:551.526.6:551.515.2**

Ray, Clifton L., **Relation of tropical cyclone frequency to summer pressures and ocean surface-water temperatures.** *Monthly Weather Review*, 63:10–12, Jan. **1935.** 4 tables. **DWB**—Spring and summer pressures at San Juan, Puerto Rico and ocean temperatures are inversely related to tropical storm frequencies in Caribbean in summer and autumn. Trade winds of winter have a correlation of +.53 with pressure over North Atlantic 16 months later. *Subject Headings:* **Long range forecasting, Correlations, Hurricanes, Sea temperatures, Trade winds.**

2B–134 551.509.33:551.590.2

Tippenhauer, L. G., **The precalculable real cause of the weather.** New York **1935.** 30 p. 25 figs. **DWB**—An account of author's method of forecasting years ahead by "cosmic electromagnetic cycles" acting through the moon and the planets. He writes "Our claims may sound incredible and too] phantastic." They are. *Subject Headings:* **Long range forecasting, Planetary influences.**

1936

2B–135 551.509.33:551.513.7

Bliss, E. W., **A forecast of Barbados rainfall.** *Royal Meteorological Society, Quarterly Journal,* 62(263):45–48, Jan. **1936.** 3 figs. **MH-BH**—Correlations of Barbados rainfall with preceding March–May pressure and temperature are charted. Calculated rainfalls based on these have a multiple correlation of .71 with observations. *Subject Headings:* **Long range forecasting, Correlations, West Indies.**

2B–136 551.583 551.509.33

Groissmayr, Fritz Béla, **Säkulare Klimaschwankungen und deren erfolgreiche Anwendung zur Vorhersage der Dürre- und Hitzeperiode 1933 bis 1934.** [Secular variations of climate and their fruitful application to forecasting periods of drought and heat 1933–1934.] *Annalen der Hydrographie und Maritimen Meteorologie,* 64:49–56, **1936.** tables, 25 refs. **DWB**—Investigations have tended to support Memery's 100-year period. *Subject Headings:* **Long range forecasting, Periodicities, Drought.**

2B–137 551.509.33

McEwen, George F., **Problems of long-range forecasting for the Pacific coast.** *American Geophysical Union, Transactions,* 1936:486–491. table. **DWB**—After briefly describing the general pressure distribution, ocean currents and seasons, author discusses possible forecasting by correlation, cycles and cosmic influences. General article. *Subject Headings:* **Long range forecasting, Pacific Coast.**

2B–138 551.509.33:519.2

McNish, A. G., **Statistical aspects of long-range weather-forecasting.** *American Geophysical Union, Transactions,* 1936:124–129. 3 figs., table. **DWB**—Tabulates and graphs frequency distribution of correlation coefficients in random series and series with autocorrelation, and tests for reality of hidden periodicities. *Subject Headings:* **Long range forecasting, Correlations, Periodicities.**

2B–139 551.509.33:551.513.7

Mindling, George W., **World weather correlation studies for the U.S. made under the W.P.A. at Atlanta, Ga.** *American Meteorological Society, Bulletin,* 17:254–256, **1936. MH-BH**—No correlation so far studied has proved permanent. Concludes that even the more encouraging results may be accidental. *Subject Headings:* **Long range forecasting, Correlations.**

2B–140 551.509.33:551.526.6

Okada, Takematsu, **Note on the correlative oscillations of the surface water temperature of the Oyasio and the Kurosio.** *Kobe, Imperial Marine Observatory, Memoirs,* 6(2):97–103, **1936.** fig., 5 tables. **GB-MO**—There is a correlation of +.53 between temperature of the warm Kurosio in winter and that of the cold Oyasio in the following summer. Hence, in a year when the water in the Japan current is abnormally cold in winter, a cool summer is expected in north Japan, especially on the east coast (correlation +.6). *Subject Headings:* **Long range forecasting, Correlations, Sea temperatures.**

2B–141 551.509.33:523.74

Petitjean, L., **Activité atmosphérique et activité solaire.** [Atmospheric and solar activity.] *Annales de Physique du Globe de la France d'Outre-mer,* 3(17), Oct. **1936.** 7 p. fig., 10 charts. **DWB**—Anomalies of mean annual pressure were opposite in sunspot max. years 1883 and 1893. An inverse symmetry point occurred in monthly sunspot numbers and monthly pressure deviations in 1888; this was discovered in 1889 and enabled author to forecast mean pressure deviations correctly in 1890–1892. *Subject Headings:* **Long range forecasting, Sunspots, Symmetry points.**

2B–142 551.543.2

Reuter, F., **Die synoptische Darstellung der ½-jährigen Druckwelle.** [The synoptic exposition of the ½-year pressure wave.] *Leipzig, Universität, Geophysikalisches Institut, Ser. 2,* 7(5):257–296,

1936. 10 plates, 22 refs. **DLC, DWB**—The ½-year pressure wave originates in the tropics from the ½-year radiation cycle. It is traced into higher latitudes and is a factor in a ½-year cycle of atmospheric circulation. It undergoes long period changes of amplitude and phase which greatly influence world weather, and explain many correlations between distant regions. Author considers that it may give a new impulse to long range forecasting. *Subject Headings:* **Long range forecasting, Periodicities.**

2B–143 551.509.33

Rose, J. K., **Intercorrelations between climatic variables in the Corn Belt.** *Monthly Weather Review*, 64:76–82, March **1936.** 7 figs. **MH-BH**—Rainfall and accumulated temperatures of the same and successive months are significantly correlated in parts of the American Corn Belt. Correlations plotted. *Subject Headings:* **Long range forecasting, Correlations, Persistence, United States.**

2B–144 551.509.33:551.515

Schell, Irving I., **A preliminary study of the Multanovskiĭ school of long-range weather forecasting.** *American Geophysical Union, Transactions*, 1936:141–152. 3 figs., 12 refs. (12 Russian items). **DWB**—Forecasting by outbreaks of cold air from sub-Arctic along recognized trajectories and by axes of anticyclonic movement is described and illustrated. Paper includes recognition of indications of future pressure distribution, seasonal forecasting by analogues, extrapolation of trajectories, normal succession of phases and empirical relations between successive seasons. Sample forecasts. *Subject Headings:* **Long range forecasting, Anticyclones, B. P. Multanovskiĭ.**

1937

2B–145 551.509.33:551.513.7

*Tu, Chang-wang, **China weather and world oscillation with application to long-range forecasting of floods and droughts of China during the summer.** *Nanking, National Research Institute of Meteorology, Memoirs*, 11(4), **1937.** 54 p. 6 figs., 29 charts, 23 tables, annual data in append. *Meteorological Magazine, Nanking*, 13:647–697, 1937. In Chinese, English summary p. 647. **DWB**—Seasonal temperature and rainfall at stations in China are correlated with preceding values of WALKER's Southern and North Atlantic Oscillations, and with rainfall of preceding seasons. A few significant results are found and regression equations constructed for summer rainfall of Middle Yangtze Valley, Su-kwan Region, Yangtze Delta, Kungschuling and Manchuli. These are moderately successful but in view of the complicated origin of Chinese rainfall, author concludes that the season is too big a unit and monthly rainfall should be used instead as a basis. *Subject Headings:* **Long range forecasting, Correlations, China.**

2B–146 551.509.33:551.577.33

Visser, S. W., **On a period of 27 months in the rainfall.** *Netherlands, (K.) Akademie van Wetenschappen te Amsterdam, Proceedings*, 40(6):513 517, **1937.** 2 figs., 4 tables. **DWB**—A complex periodicity of 27 months with a large second harmonic was found in rainfall of the Atlantic and western Europe, advancing from Fernando Noronha to Thorshavn in about 7 months, and reversed over Europe. (*See item* 2B–147.) *Subject Headings:* **Long range forecasting, Periodicities.**

2B–147 551.509.33:551.577.33

Visser, S. W., **Seizenvoorspelling.** [Seasonal weather forecasts.] *Hemel en Dampkring*, 35:313–317, **1937**; 36:10–13, 166–169, 282–285, 1938; 37:28–31, 168–171, 272–274, 373–375, 1939; 38:16–18, 1940. **DLC**—Forecasts based on periodicities of 27 months and 9 years. *Subject Headings:* **Long range forecasting, Periodicities.**

2B–148 551.509.33:551.513.7

*Walker, Sir Gilbert and Bliss, E. W., **World weather VI.** *Royal Meteorological Society, Memoirs*, 4(39):119–139, Jan. **1937.** 19 figs., 10 tables, 6 append. of data. Discussion by G. T. WALKER and the tabulation by E. W. BLISS. **DWB**—Extends correlations with "Oscillations" given in **World Weather V** to remaining seasons. Southern Oscillation Sept.–Nov. has correlation of +.90 with that for Dec.–Feb. following. *Subject Headings:* **Long range forecasting, Atmospheric circulation, Correlations.**

1938

2B–149 551.509.33

Asknaziĭ, A. I., **K voprosu o dolgosrochnoĭ prognostike pogody.** [On the problem of long range weather forecasting.] *Meteorologiia i Gidrologiia*, No.1:21–28, **1938.** **DWB**—The first part deals with "synoptic inertia" or persistence of marked deviations of pressure from normal over 3 months or more due to persistent conditions such as ocean currents or ice. Construction of charts

of such conditions recommended. Then considers causes of outbreaks of cold Arctic air, influx of tropical air, regions of their formation and position of the polar front. A suggestive paper. *Subject Headings:* **Long range forecasting, Air masses, Persistence, U.S.S.R.**

2B–150 551.509.33:551.506.1

*Baur, Franz, **Der Mitteleuropäische Witterungsbericht.** [The central European general weather report.] *Meteorologische Zeitschrift*, 55:142–147, **1938.** 3 figs., table. **DWB**—An account of the monthly report started by the Forschungsstelle für langfristige Witterungsvorhersage [Research center for long range weather forecasting] in January 1930 and last revised Jan. 1, 1938, to give an account of the course of general weather over Europe. It includes solar data, mean pressures and departures, interdiurnal variability, correlation coefficients, pressure chart of Northern Hemisphere, etc. The report is a valuable source of data. *Subject Headings:* **Long range forecasting, Monthly weather reports.**

2B–151 551.543.3:523.74

Clayton, Henry Helm, **The sunspot period in atmospheric pressure.** *American Meteorological Society, Bulletin*, 19(5):218–221. May **1938.** 4 figs., 4 refs. **MH-BH**—Mean annual pressure in tropics varies inversely with sunspots. World charts show pressure deviations in 3 years of spot max. The developments are due to progressive movements of centers of pressure deviation equatorwards in high latitudes, W–E in middle latitudes. *Subject Headings:* **Long range forecasting, Pressure anomalies, Sunspots.**

2B–152 551.509.33:551.513.7

Iyer, V. Doraiswamy, **Foreshadowing formula for the monsoon rainfall of Upper Siam.** *Royal Meteorological Society, Quarterly Journal*, 64(275):342–344, April **1938.** fig. **MH-BH**—Check of previous formula with 10 years' subsequent data proved unsatisfactory. A new regression formula is obtained from preceding pressures in South America, Central Siberia and Honolulu and rainfall in South Rhodesia. The multiple correlation of .81 is significant by Fisher's test. *Subject Headings:* **Long range forecasting, Correlations, Siam.**

1939

2B–153 551.509.33:551.577.37/8

Cheng, K. Y., **The floods and droughts of the lower Yangtze Valley and their prediction.** *Nanking, National Research Institute for Meteorology, Memoirs*, 9:7–17, **1939.** 4 figs., 6 tables.—From selected correlation coefficients author calculated regression equations for summer rainfall of Hankow, Nanking and Chinkiang with total correlations of .69, .66 and .54 respectively. A periodicity of about 10 years is also considered. *Subject Headings:* **Long range forecasting, Correlations, Drought, Floods, China.**

2B–154 551.509.33

Groissmayr, Fritz Béla, **Die Bedeutung der Witterungsperioden für die langfristige Vorhersage. Die Sommer 1931–1938 in Mittel- und West-Europa und ihre prognostische Erfassung durch Witterungsperioden von 6, 7¼, 24 und 100 Jahren.** [The importance of weather cycles for long range forecasting. The summers of 1931–1938 in Central and West Europe and their prognostic determination by cycles of 6, 7¼, 24 and 100 years.] *Zeitschrift für angewandte Meteorologie*, 56:10–20, **1939.** 17 tables, 18 refs. **DWB**—Tables show effect of these "neglected" periodicities—6-year cycle in summer drought, the Besson cycle between April temperature and July temperature 7 years later, Groissmayr's 24 and 100 year cycles in summer temperature of Central Europe and wine harvest in France. These would have made forecasts of the character of individual summers practicable. *Subject Headings:* **Long range forecasting, Periodicities, Europe.**

2B–155 551.509.33:551.590.2

Jones, Inigo, **On the methods adopted as a means of seasonal forecasting at Crohamhurst Observatory and the reasons therefor.** *Crohamhurst Observatory Paper*, No. 10, **1939.** 16 p. 5 plates. **GB-MO**—Rainfall, storms etc. in Australia are forecast on the basis of cycles of revolution of Jupiter and Saturn through their effect on sunspots. Illustrated by "cyclical repetition" of rainfall at Crohamhurst. *Subject Headings:* **Long range forecasting, Planetary influences, Sunspots, Australia.**

2B–156 551.509.33

Krick, Irving P., **A technique for the preparation of monthly weather predictions.** *International Union of Geodesy and Geophysics, Meteorology, Procès-Verbaux* **1939** (1940), (2):68–69. Discussion p. 70–71. **GB-MO**—Charts have been compiled of mean monthly air transport, isotherms and

frontogenesis. The weather is controlled by the various air streams and their interaction. Deviations of air streams from normal in the month following autumnal or vernal equinox persist in a general way through the following months. Rhythms must also be considered. *Subject Headings:* **Long range forecasting, Air masses.**

2B–157 551.509.33:551.311.181

Ovchinnikov, I., **Opyt predskazaniia ledovitosti Chukotskogo Moria.** [Forecasting ice conditions in the Chuckchee Sea.] *Meteorologiia i Gidrologiia*, 4:89–94, **1939.** 2 figs. 8 refs. **DWB**—Method of forecasting dates of opening of navigation from Jan. temperature deviations in latitude of Kola, winter temperature at Ouellen, Dec. pressure at Barrow and in center of Icelandic Low. *Subject Headings:* **Long range forecasting, Polar ice, Correlations.**

2B–158 551.509.33:551.513.7

Rimmer, T. and Hossack, A. W. W., **Foreshadowing summer rain in Queensland.** *Queensland University, Dept. of Physics, Papers*, 1(3), **1939.** 15 p. 2 figs., 6 tables. **DWB**—Correlation coefficients are given between rainfall in 7 districts of Queensland and world weather. Correlations with Walker's "Southern Oscillation" in preceding winter range from .56 to .75. Use of other variables raises multiple correlation to .72 to .81. With predictions limited to those with a 4:1 chance of success, formulas gave satisfactory results over 8 years not used in the computations. *Subject Headings:* **Long range forecasting, Correlations, Australia.**

2B–159 551.509.33(09)

Savur, S. R., **Seasonal forecasting in India.** *National Institute of Sciences of India, Proceedings*, 5:49–59, **1939.** **GB-MO**—A historical summary of the growth of monsoon forecasting in India. *Subject Headings:* **Long range forecasting, History, India.**

2B–160 551.509.33:551.590.21

Tetrode, P., **Voorwaarden voor belangrijke invloeden van de zonnenvlekkenperiode op ons weer en een voorspelling op zeer langen termijn.** [Conditions necessary for important influences of the sunspot period of our weather and a very long period forecast.] *Hemel en Dampkring*, 37:225–234, **1939.** 2 figs. **DLC**—Discusses variations of temperature, severe winters etc., in sunspot cycle and periodical changes of phase. Author forecasts that after the seven warm years 1932–1938 there will be seven cooler years. *Subject Headings:* **Long range forecasting, Severe winters, Sunspots.**

1940

2B–161 551.509.33

Gillette, Halbert P., **Forecasting by means of climatic cycles.** Atlantic City, New Jersey, **1940.** 6 p. **DWB**—*Subject Headings:* **Long range forecasting, Periodicities.**

2B–162 551.509.33

Visser, S. W., **Weersverwachting op langen termijn.** [Long-term weather forecasting.] (*K.*) *Nederlandsch Aardrijkskundig Genootschap, Tijdschrift*, Ser. 2, 57(1):99–107, Jan. **1940.** 4 figs. **GB-MO**—A report on the possibility of long range forecasting in Holland by (a) periodicities of 2¼, 3¼ and 5½ years; (b) correlations with various preceding data. Illustrated by a forecast formula for spring temperature giving multiple correlation of .75 and of Dec. temperature (R = .917). Author concludes that there are good prospects of successful forecasting. *Subject Headings:* **Long range forecasting, Correlations, Periodicities, Netherlands.**

1941

2B–163 551.509.33:551.521.13

Abbot, Charles Greeley, **An important weather element hitherto generally disregarded.** *Smithsonian Miscellaneous Collections*, 101(1), May 27, **1941.** 34 p. 11 figs., 5 tables. **DWB**—Lists 10 periodicities, 8½ months to 23 years, in solar constant and gives results of synthesis up to 3 years ahead. Similar periodicities are found in weather. On this basis, monthly forecasts of temperature and precipitation were made up to 5 years ahead for places in U.S.A. and proved fairly successful. Day to day changes in solar radiation, largely influenced by the sun's rotation, are a factor in weather for 2 weeks ahead. *Subject Headings:* **Long range forecasting, Periodicities, Solar constant, United States.**

2B–164 551.509.33:523.74

Clayton, Henry Helm, **The zonal index and solar activity.** *American Geophysical Union Transactions*, 1941:420–423. 6 figs. **DWB**—Zonal index etc. compared with sunspots (agreement

in summer, opposition in winter). Types of pressure change following sunspot numbers are: latitude of belt of max. pressure, air-mass oscillation between low and high latitudes and between continent and ocean. Causes briefly tabulated. *Subject Headings:* **Long range forecasting, Sunspots, Zonal index.**

2B–165 551.509.33:551.543.3

de Boer, H. J., **On the physical reality of some long periodic cycles in the barometric pressure of Batavia.** *Indonesia,* [*K.*] *Magnetisch en Meteorologisch Observatorium te Batavia, Verhandelingen,* No. 29, **1941.** 21 p. **DWB**—Rough methods gave periodicities of 2.33, 3.33, 6, 7.33, 8½, 11 and 16 years. The 6-year period was the best and was found to be developed also in South Pacific near New Zealand, and in North Atlantic near Greenland. *Subject Headings:* **Long range forecasting, Periodicities, Batavia, Java.**

2B–166 551.509.33:551.557

Iyer, V. Doraiswamy, **Forecasting the "Northeast monsoon" rainfall of South Madras.** *India, Meteorological Dept., Scientific Notes,* Poona, 8(98):147–154, **1941. DWB**—Upper winds in India between 3 and 8 km. in September are used as well as South American pressure June-Aug. *Subject Headings:* **Long range forecasting, Correlations, Upper air winds, India.**

2B–167 551.509.33

Takahashi, K., **On the seasonal forecasting in Japan.** *Meteorological Society of Japan, Journal,* 2nd Ser., 19(9):344–351, Sept. **1941.** In Japanese, English summary p. (33). fig. **DWB.** Also in *Central Meteorological Observatory of Japan, Bulletin,* Tokyo, 20, 1942. **DWB**—Correlation coefficients between successive monthly values of meteorological elements show air temperature to be the most conservative. This is applied to various monthly forecasts, successfully for January temperature at Singking and for Bai-u rains, but is not yet suitable for practical use. *Subject Headings:* **Long range forecasting, Persistence, Japan.**

2B–168 551.509.33:551.513.7

†Weightman, R. H., **Preliminary studies in seasonal weather forecasting.** *Monthly Weather Review Supplement,* 45, **1941.** 99+p. biblio. p. 61–63. **DWB**—Refers to various previous investigations. Work since 1931 deals with correlations between pressure at various foreign stations and subsequent temperature and precipitation in the U.S.A. *Subject Headings:* **Long range forecasting, Correlations, United States.**

1942

2B–169 551.509.33

Bergeiro, José María, **Modalidad y probabilidades del tiempo en el verso de cada mes. Notion de ritmo y previsiõn por método estadistigráfico de "Índices de frecuencia."** [Weather trend and probabilities of weather of each month. The idea of rhythm and forecasting by the statistical method of "frequency indexes."] Contribution (sic) al mejor conocimiento del clima, Montevideo, **1942:** 44 [p.]—Unchecked. *Subject Headings:* **Long range forecasting, Periodicities, Statistical forecasting.**

2B–170 551.509.33:523.74

Clayton, Henry Helm, **The sunspot period and spring rainfall in the United States.** *American Geophysical Union, Transactions,* **1942**:284–286. 2 figs., 4 tables. **DWB**—Gives percentages of spring precipitation in each sunspot year in Arizona, South Dakota and Florida. Excess at spot max. 100% in Arizona (low pressure), 30% deficit in Florida (high pressure area). *Subject Headings:* **Long range forecasting, Sunspots, United States.**

2B–171 551.509.33

Gherzi, Ernest, **On forecasting the mean temperature of next summer and next winter.** *American Meteorological Society, Bulletin,* 23:83–84, Feb. **1942. DWB**—Mean temperature of April at Zi-Ka-Wei, China, has correlation of −.50 to −.60 with mean temperature of next summer. Correlations of Oct. with next winter less good. *Subject Headings:* **Long range forecasting, Persistence, China.**

2B–172 551.509.33

Hirano, R., **On the seasonal weather forecasting by means of the type of variation of the atmospheric pressure.** *Central Meteorological Observatory of Japan, Bulletin,* Tokyo, 19:414, **1942. DWB** —Unchecked. *Subject Headings:* **Long range forecasting, Weather types, Japan.**

2B–173 551.509.33:551.513.7

Iyer, V. Doraiswamy and Seshacher, C., **Forecasting the monsoon rainfall in Mysore.** *India, Meteorological Dept., Scientific Notes*, Poona, 8(95):117–129, **1942.** 5 figs., tables. **DWB**—Mysore is divided into two natural regions (Malnad and Maidan) and regression formulas are worked out for each rainfall June–Sept. For Malnad 4 factors (including sunspots) give a multiple coefficient R = .60. For Maidan 5 factors give R = .73, and for Sept.–Nov. 3 factors give R = .75. These are significant but no tests of performance were possible. *Subject Headings:* **Long range forecasting, Correlations, Sunspots, India.**

2B–174 551.509.33:551.513.7

Po E, Maung, **The foreshadowing of the rainfall of Burma.** *Royal Meteorological Society, Quarterly Journal*, 68(296):217–225, July **1942.** 6 figs., 7 tables, 8 refs. Discussion p. 225–228. **DWB.** Review in: *American Meteorological Society, Bulletin*, 23:372–374, 1942. **DWB**—Regression equations are developed for 3 regions on Burma coast and gave satisfactory retrospective verification. *Subject Headings:* **Long range forecasting, Correlations, Burma.**

2B–175 551.509.33:551.582

Schell, I. I., **On the use of climatically coherent areas in seasonal foreshadowing.** *American Meteorological Society, Bulletin*, 23:182–183, April **1942.** **DWB**—Correlation involving areas not climatically homogeneous may be misleading. *Subject Headings:* **Long range forecasting, Climatic regions, Homogeneity.**

2B–176 551.509.33:551.547

Takahashi, K., **Isobars in the upper layer of the atmosphere and long range weather forecast.** *Meteorological Society of Japan, Journal*, 2nd Ser., 20(3):76–83, March **1942.** 12 figs. In Japanese, English summary p. (7). **DWB**—The relation between long-period changes of weather and isobars at 3000 m. over Japan (calculated from surface pressure and temperature) is examined and the possibility of long range weather forecasts shown. *Subject Headings:* **Long range forecasting, Upper air pressure, Japan.**

1943

2B–177 551.509.33

India, Meteorological Dept., **On forecasting dates of establishment of the south-west monsoon on the west coast of India.** Abstract from "Annual Report of Agricultural Meteorological Section of the India Meteorological Department, 1939–40." *American Meteorological Society, Bulletin*, 24:217–218, May **1943.** **DWB**—Dates of establishment of monsoon along west coast of the Peninsula were computed. Relations to other factors were investigated by dot diagrams. April rain at Seychelles and date on which smoothed pressures at Lahore and Bangalore became equal were found to precede monsoon by about 1½ months. A regression equation was calculated. *Subject Headings:* **Long range forecasting, Correlations, India.**

2B–178 551.509.33:551.590.2

Jones, Inigo, **Long-range weather forecasting.** Reprinted in 1946 from *Queensland Geographical Journal*, 48[1943–44]. 27 p. 7 figs. **GB-MO**—A general talk on cycles, influence of planets, etc. leading to author's own researches on planetary cycles in Australia. Rainfall is forecast on a combination of 84, 71, 59 and 35 year cycles. Rather obscure. *Subject Headings:* **Long range forecasting, Periodicities, Planetary influences, Australia.**

2B–179 551.515.13:523.74

Kullmer, C. J., **A remarkable reversal in the distribution of storm frequency in the United States in the double Hale solar cycles, of interest in long-range forecasting.** *Smithsonian Miscellaneous Collections*, 103(10). **1943.** 20 p. 27 figs. **DWB**—Annual frequencies of centers of depressions in the U. S. 1874–1940, by cells of 2½° lat., 5° long, are discussed, by groups of 3 years about each sunspot max. and min. The differences show an alternation of two patterns (3 bands of max. difference; j-shaped band), each pattern persisting for two sunspot cycles. Appended charts show frequencies of storm centers and differences between max. and min. years, 1931–1940. Application to long range forecasting not clear. *Subject Headings:* **Long range forecasting, Cyclone tracks, Sunspots.**

2B–180 551.509.33:551.590.2

Laun, W., **Gibt es Gesetzmässigkeiten im Wetterablauf?** [Are there laws of the evolution of weather?] *Zeitschrift für angewandte Meteorologie*, 60(10):305–309, **1943.** **DWB**—Discusses first long periodicities (6–245 years) attributed to periods of revolution of planets. Then considers symmetry points and their relation to singularities and the general weather sequence. Cosmic

effects on the rotating earth are considered to supply the slight impulse required to set in motion natural oscillations. *Subject Headings:* **Long range forecasting, Planetary influences.**

2B–181 551.543:523.74

Schell, Irving I., **The sun's spottedness as a possible factor in terrestrial pressure.** *American Meteorological Society, Bulletin*, 24:85–93, March **1943.** 5 tables, 7 refs. **DWB**—Author finds that pressure in low latitudes falls relatively to high latitudes in Dec.–Feb. in periods of high sunspot activity, and rises in periods of low spot activity. *Subject Headings:* **Long range forecasting, Sunspots.**

2B–182 551.509.33

Shtabova, A. P., **Estestvennye sinopticheskie periody na territorii Sibiri i Dal'nego Vostoka.** [Natural synoptic periods in the territory of Siberia and the Far East.] (In **Sinopticheskaia Meteorologiia,** Pagava, S. T. (ed.), *GUGMS, N-IU, Trudy*, Ser. II, (3), **1943.** p. 48–65. 17 figs.) **DWB**—The methods of Multanovskiĭ are applied to the Far East and Siberia. A series of composite charts show the movements of air masses and fronts for 16 discrete periods of about a week each during the years 1934–1940. *Subject Headings:* **Long range forecasting, Weather types, Siberia, U.S.S.R.**—*M.R.*

2B–183 551.509.33

Shishkov, V. G., **Issledovanie trekh- i piatimesiachnykh ritmov v atmosfere na territorii Sredneĭ Azii.** [Investigation of three and five month rhythms in the atmosphere in the territory of Central Asia.] (In **Sinopticheskaia Meteorologiia,** Pagava, S. T. (ed.), *GUGMS, N-IU, Trudy*, Ser. II. (3), **1943.** p. 74–78.) **DWB**—Although a 3 or 5 month rhythm could not be found in the circulation patterns of European U.S.S.R. or Siberia, the author thought it worth while to test the circulation patterns over Central Asia by tabulating the number of cases of Arctic invasions 45 and 90 days, and 75 and 150 days (respectively) after previous invasions. He claims that out of 209 cases of invasions along the Taimyr and Kara Axes, which were examined, 94% showed agreement with the 3 or 5 month rhythm (±2 days) making it a seemingly good basis for monthly forecasts; but that out of 13 cases tested for the winter season, only 69% were successful. Therefore the author suggests further study to determine what seasonal effects operate on polar invasions into Central Asia. *Subject Headings:* **Long range forecasting, Periodicities, Central Asia, U.S.S.R.**—*M.R.*

2B–184 551.509.33:523.74

von Myrbach, O., **Die Strenge der letzten Winter in Wien in Beziehung zum Sonnenfleckenverlauf.** [The rigor of recent winters in Vienna in relation to the course of sunspots.] *Meteorologische Zeitschrift*, 60(9):320, Sept. **1943.** table. **DLC**—In 1940 author found the rule that after years of mean sunspot number greater than 20, very cold winters occur in Vienna if spot number of winter is at least 14 lower than that of preceding summer. This rule was found to hold for the severe winters 1939–40 to 1941–42. *Subject Headings:* **Long range forecasting, Sunspots, Severe winters.**

1944

2B–185 551.509.33:551.521.13

Abbot, Charles Greeley, **Weather predetermined by solar variation.** *Smithsonian Miscellaneous Collections*, 104(5), **1944.** 44 p. 24 figs., 5 tables. **DWB**—Departures of daily temperature and pressure following 440 sequences of solar constant values are tabulated. It is found that solar changes affect weather for about 20 days and may alter temperature by 10–15°F.; this is confirmed by a study of flocculi. Solar forecasts are attempted and predictions given of weather in 1944 to 1946. Other forecasts are based on repetition in a 273 month cycle of solar radiation and 14 shorter cycles, especially 8½ months. *See also*: Abbot, C. G., **On the 27.0074 day cycle in Washington precipitation,** *ibid.*, 104(9), 1945, 2 p. table; 1945–1946 report on . . . 104(21), 1946, 2 p. table; 1946–1947 report on . . . 107(3), 1947, 2 p. table; 1948–1949 report on . . . 111(5), 1949, 2 p. 2 tables; **A prediction of Washington temperature 1948 (made January 1948),** 111(6), 1949, 4 p. chart, table. **Short period solar variations and the temperatures of Washington and New York,** 111(13), 1949. 8 p. 2 figs., 2 tables; **Periodic influences on Washington and New York weather of 1949 and 1950,** 111(17), 1950. 8 p. 3 figs., 6 tables. In the last two, forecasts by periodicities of 6.6456 and 27.0074 days are stated to have been verified. *Subject Headings:* **Long range forecasting, Periodicities, Solar constant.**

2B–186 551.509.33

Baur, F., **Über die grundsätzliche Möglichkeit langfristiger Wettervorhersage.** [On the basic possibility of long range weather forecasts.] *Annalen der Hydrographie und Maritimen Meteorologie*,

72:15–25, 1944. **DWB**—The argument, based on a study of probabilities, is summed up: 1) There exist overall variable complexes of conditions through which the probability of occurrence of long period weather types (months and seasons) of definite character varies from year to year. 2) These variations of the "formative probabilities" are, apart from the main annual variation, much more important for the character of the weather than are probabilities connected with the calendar. *Subject Headings:* **Long range forecasting, Weather types.**

2B–187 551.509.33:551.577

Hiyama, K., **One method for predicting the precipitation in the "Bai-u Season." A statistical investigation of the seasonal forecasting in Japan. Pt. 1.** *Meteorological Society of Japan, Journal*, 2nd Ser., 22:205–214, 1944. 7 figs. In Japanese, English summary p. (12). **DWB**—A positive relation is found between distribution of precipitation in Feb. and that in June. The exception in 1926 is explained. *Subject Headings:* **Long range forecasting, Bai-u, Japan.**

2B–188 551.509.33:551.465

Jagsich, Juan, **Influencia oceánica en nuestro tiempo. Posibilidades del pronóstico del tiempo a largo plazo.** [Oceanic influence on our weather. Possibilities of long range weather forecasting.] *Revista Meteorológica*, 3(12):305–384, Oct. **1944.** 78 figs., 7 maps, 45 refs. **DLC.** *See also: Inst. Nac. Invest. Geogr.*, Montevideo, No. 5, 1944. **GB-MO**—An introductory study of the possibility of long range forecasting in Uruguay. Chap. 1 describes a periodicity of 3 years in rainfall, influence of solar activity and solar constant, and volcanic eruptions. The 3-year cycle is supposed to originate in the interiors of continents and to be transmitted by variations of ocean currents. Chap. 2 describes the effect of the intensity of the atmospheric circulation on Uruguay weather, again through the 3-year oscillation and ocean currents. Chap. 3 deals especially with the Brazil Current and prevailing winds, and shows some parallelism between rainfall and temperature of Fernando Noronha and subsequent weather in Uruguay. In Chap. 4 the effect of the Humboldt Current is shown in numerous graphs. Chap. 5 discusses effect of air-mass trajectories, Chap. 6 that of the Malvinas Current and Chap. 7 that of the South Orkneys on Uruguay weather. In the final chapter author recommends the creation of a Spanish-American oceanographical institute to study these results with a view to long range forecasting. *Subject Headings:* **Long range forecasting, Ocean currents, Periodicities, Uruguay.**

2B–189 551.509.33:551.590.2

Morosov, N., **O vozmozhnosti nauchnogo predvychesleniia pogody pri vvedenii v analiz galakticheskikh vozdeĭstvii.** [On the possibility of a scientific prognosis of the weather by an analysis of galactic influences.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geogr. i Geofiz.*, 8(2–3):63–71, **1944.** 20 figs. English summary p. 71. **DLC**—A preliminary account of investigations into cosmic influences on weather. Some relations set out in diagrams were found when meteorological observations were converted from sun time to star time. *Subject Headings:* **Long range forecasting, Cosmic influences.**

1945

2B–190 551.509.33:551.577.33

Curé, P., **Périodicité des éléments du climat au Pic-du-Midi.** [Periodicity of climatic elements of Pic-du-Midi.] *La Météorologie*, 3rd Ser., Nos. 58–59–60:121–139, **1945.** 10 figs., tables. **MH-BH**—From a study of unsmoothed and smoothed curves of climatic elements and frequency distributions, author concludes that there are no real periodicities. He finds quasi-periodicities of 5 and 2 years in annual rainfall. *Subject Headings:* **Long range forecasting, Periodicities, France.**

2B–191 551.509.33

Diaz, Severo, **Nueva meteorología. 2 pte. Nuevos hechos, pronosticos, grandes perspectives.** [Modern meteorology. Pt. 2. New ideas, forecasts, general view.] Guadalajara, **1945.** 84 p. numerous figs. and tables. **GB-MO**—Chap. 2 deals with forecasting. Monthly forecasts were issued, apparently on the basis of the southward movement of weather systems from the U. S. Examples and verification quoted. *Subject Headings:* **Long range forecasting, Weather types, Mexico.**

2B–192 551.509.33:551.513.7

Maung Kha, Maung, **Forecasting the coastal rainfall of Burma.** *Royal Meteorological Society, Quarterly Journal*, 71(307–308):115–125, Jan.–April **1945.** 3 figs., 4 tables. **MH-BH**—Forecasting formulas are obtained for June–Aug. rain of Arakan coast, Irrawaddy Delta and Tenasserim Coast, by first plotting world charts of anomalies of pressure and temperature for very deficient and excessive rain, selecting the common features and then calculating regression equations by Walker's method.

Multiple correlation .79 to .87. Failures due to local thunderstorm rainfall. *Subject Headings:* **Long range forecasting, Correlations, Burma.**

1946

2B–193 551.509.33:551.590.21

Boutet, R. A., **Récurrence des invasions polaires.** [Recurrence of polar invasions.] *Revue Scientifique*, 84(10):596–604, **1946.** 8 figs., 21 refs. **DLC**—Author studied recurrences of invasions of Arctic air at level of tropopause (300 mb.) over France in 1945–46, and found recurrences at about 10, 20–22 and around 40 days, which agree with "pseudo-periodicities of solar relaxation." He suggests that this may permit forecasts of at least two months, but the invasions are very variable in speed, intensity and trajectory. *Subject Headings:* **Long range forecasting, Arctic air, Solar relations, France.**

2B–194 551.509.33:551.513.7

Iyer, V. Doraiswamy and Satakopan, V., **Regression formulae for forecasting the monsoon rainfall in the subdivisions of peninsular India.** *India, Meteorological Dept., Scientific Notes*, Poona, 9(101):1–14, **1946.** 3 figs., 4 tables, 11 refs. **DWB**—After quoting formulas in use, authors correlate monsoon rainfalls of 12 districts of India with various antecedent factors and construct regression equations for 10 districts. The multiple correlations range from .65 to .44 and are statistically significant except for Madras Deccan and southeast of Madras. The suitability of the equations is shown by comparing observed and forecast rainfalls for the remaining 8 districts. *Subject Headings:* **Long range forecasting, Correlations, India.**

2B–195 551.509.33(02)

†§Pagava, S. T., Duletova, T. A., Rozhdestvenskiĭ, A. A. and Shirkina, N. A., **Osnovy sinopticheskogo metoda dolgosrochnykh prognozov pogody.** [Principles of the synoptic method of long range weather forecasting.] Leningrad, Gidromet. Izdat., **1946.** 368 p. 252 figs., 56 tables. **DWB**—Chap. 1, Mechanism of air mass exchange, theory of general atmospheric circulation, centers of atmospheric activity, dominator, axes, coordination of synoptic processes. Chap. 2, Schematics and typification of atmospheric processes: collective charts, principle of dividing atmospheric processes according to time, elementary synoptic processes, natural synoptic period. Chap. 3, Natural synoptic seasons. Chap. 4, Synoptic conditions of some seasonal phenomena: freezing of rivers in European U.S.S.R., accumulation of water under snow on rivers of N.W. Russia, break-up of ice on rivers. Chap. 5, Dividing macroprocesses into phases (with special reference to ice storms). Chap. 6, Rhythmical activity in the atmosphere: history, 3 and 5 month rhythms, calculation of intensity of influx of cold air masses, relations between rhythms and phases of macroprocesses. Chap. 7, Principle of how to compile long term forecasts: choosing analogies with the synoptic season preceding the month for which the forecast is made, determining circulation mechanisms by means of rhythms and the phases of macroprocesses, forecasting for a natural synoptic period, forecasting times and general character of freezing of rivers and time of break up of ice. List of 72 published works of B. P. Multanovskiĭ's school. *Subject Headings:* **Analogues, Atmospheric circulation, Periodicities, B. P. Multanovskiĭ, U.S.S.R.**

2B–196 551.509.33

Sendai District Central Meteorological Observatory. **Journal of the study of long range forecasting in Tôhoku District.** 6, **1946,** 3rd and 4th extra numbers.—Unchecked. *Subject Headings:* **Long range forecasting, Japan.**

2B–197 551.509.33:551.513.7

Schell, Irving I., **Foreshadowing this winter's (1945/46) precipitation in the Northern Rocky Mountains and North Pacific States Region.** *American Meteorological Society, Bulletin*, 27:131–132, **1946.** table, 3 refs. Verification p. 348–349. table, 2 refs. **DWB**—Forecast based on Sept.–Nov. tropical Australasian pressure (correlation −.63) and intervening area of N. Pacific. Forecast that deviation of precipitation would not exceed 25%. Similar papers in later issues. *Subject Headings:* **Long range forecasting, Correlations, United States.**

2B–198 551.509.33:551.524

Schindler, G., **Versuch einer Temperaturprognose eines Winters nach Ablauf seiner Halbzeit mit Hilfe der Kältesummen.** [Attempt to forecast the winter temperature half-way through with the help of accumulated degrees of cold.] *Naturforstliche Gesellschaft, Vierteljahrsschrift*, Zurich, 91:261, **1946. GB-MO**—When the accumulated temperature below 0°C. has not reached its normal value by Jan. 15, the winter as a whole will not be cold. This permits a forecast of 45 days [!] *Subject Headings:* **Long range forecasting, Persistence.**

2B–199 551.509.33

Visser, S. W., **Weersverwachtingen op langen termijn in Nederland.** [Long range forecasts in Holland.] (*K.*) *Nederlandsch Meteorologisch Instituut, Mededeelingen en Verhandelingen*, 51, 1946. 143 p. 25 figs., 70 tables, 52 refs. English summary. **GB-MO**—A study of periodicities of 35, 13, 11, 9, 8, 6.8, 5¼, 3¼, 2¼ years in temperature and rainfall and 28 months in pressure, and of relations with weather in other countries and with sunspots. Successful forecasts were made with these correlations. *Subject Headings:* **Long range forecasting, Correlations, Periodicities, Sunspots, Netherlands.**

2B–200 551.509.33:551.311.18

Vitel's, L. A., **Vspomogatel'nyĭ sinopticheskiĭ metod dolgosrochnogo fonovogo prognoza ledovykh iavleniĭ na rekakh severa evropeĭskoĭ territorii SSSR.** [Auxiliary synoptic method of long range forecasting of ice on the rivers of the northern part of European U.S.S.R.] *Meteorologiia i Gidrologiia*, No. 4:47–55, **1946.** 4 figs., 3 tables, biblio. **DLC**—Forecasts a month, season and even a year ahead are based on synoptic charts, pressure anomalies, etc. *Subject Headings:* **Long range forecasting, Pressure anomalies, River ice, U.S.S.R.**

1947

2B–201 551.509.33:551.513.7

Bergeiro, José María, **El pronóstico del tiempo a largo plazo, ante el problema de las repercusiones climaticas.** [Long range weather forecasting, and the problem of climatic repercussions.] *Boletín Meteorológica*, Montevideo, 5(6):19–24, **1947.** 2 figs. **MH-BH**—After a short account of previous work on regression equations for forecasting seasonal weather, author sets out theory of rhythms and finds an inverse relation between July temperature in Tokyo and following Dec. and Jan. in Montevideo (in same latitude in opposite hemisphere). *Subject Headings:* **Long range forecasting, Correlations, Uruguay.**

2B–202 551.509.33:551.513.7

de Boer, H. J., **On forecasting the beginning and the end of the dry monsoon in Java and Madura.** *Indonesia*, (*K.*) *Magnetisch en Meteorologisch Observatorium te Batavia, Verhandelingen*, No. 32, **1947.** 20 p. 9 tables. **MH-BH**—Regression equations are computed for 12 districts for forecasting on Sept. 1 the decade in which rains will start, using pressures at Kupang, Mauritius and Honolulu and temperature at Hong Kong, and for 13 districts for forecasting on March 1 decade of end of rains, using pressures at Mauritius, Manila and Santiago de Chile, temperature at Hong Kong and rain at Port Blair. Multiple correlations exceed .8. A possible explanation is given. *Subject Headings:* **Long range forecasting, Correlations, Java.**

2B–203 551.509.33:551.590.2

Jones, Inigo, **Australian weather forecasts. Explanation of weather cycles and estimate of probable weather during 1948.** Sydney, N.S.W., **1947.** 21 p.—Unchecked. *Subject Headings:* **Long range forecasting, Planetary influences, Australia.**

2B–204 551.509.33:551.590.21

Rubashev, B. N. and Bezrukova, A. Y., **Mezhdusezonnye perelomy sinopticheskikh protsessov, dlina sinopticheskogo goda i solnechnaia aktivnost.** [Inter-seasonal interruptions of synoptic processes, duration of the synoptic year and solar activity.] *Vsesoiuznoe Geograficheskoe Obshchestvo, Izvestiia*, 79(3):341–345, May–June **1947.** 10 figs., 2 tables. **DLC**—According to the Multanovskiĭ school there are 5 seasons: winter, spring, summer, autumn, fore-winter, each of which is preceded by an interruption. The lengths of the seasons vary; effect of solar activity is considered. *Subject Headings:* **Long range forecasting, Seasons, Solar radiation, U.S.S.R.**

2B–205 551.509.33:551.513.2

Schell, Irving I., **Dynamic persistence and its applications to long-range foreshadowing.** *Harvard Meteorological Studies*, No. 8, **1947.** 80 p. 22 figs, 27 tables, 32 refs. **DWB**—Dynamic persistence is applied to forecasting tendencies, especially the rainy monsoon of the East Indies, monthly temperature of northern Europe, precipitation of northwest Europe in autumn and early winter, and of tropical Australasia, America and the Pacific in winter. *Subject Headings:* **Long range forecasting, Persistence.**

1948

2B–206 551.509.33:551.513.7

Bullig, H. J., **Ergebnisse zum Thema: Grossräumige Witterungszusammenhänge.** [Results on the theme: weather connections over large areas.] *Annalen der Meteorologie*, (9/11):263–268,

1948. 4 figs., 7 refs. German and English summaries p. 263. **MH-BH**—Correlations are discussed between weather of tropics and mid-latitudes, due to radiation, and between weather situations over Europe and water temperature of Atlantic. *Subject Headings:* **Long range forecasting, Correlations, Sea temperatures.**

2B–207 551.509.33

Kagari, M., Otake, S. and Kawai, J., **The investigation on long range forecasting of the next spring temperature from the data of winter.** *Meteorological Society of Japan, Journal, 2nd Ser.* 26(1): 23–29, **1948.** In Japanese. 8 figs. **MH-BH**—Data at Toyama or Fushiki give significant correlation coefficients. *Subject Headings:* **Long range forecasting, Correlations, Japan.**

2B–208 551.509.33

Konček, M., **Dihobodé predpovede pocasia podl'a B. Multanovského.** [Long range weather forecasts according to B. Multanovskiĭ.] *Meteorologické Zprávy,* 2(3):53–55, **1948.** 2 figs., 13 refs. In Czech. **MH-BH**—Sets out Multanovskiĭ's later ideas. Charts of weather types indicate repetition after 90 and 150 days ±2, in which sequences of events follow in the same order. Forecasts for a month and year based on this principle are issued by the U.S.S.R. Weather Service. *Subject Headings:* **Long range forecasting, Periodicities, B. P. Multanovskiĭ, U.S.S.R.**

2B–209 551.509.33:551.577

Solot, Samuel B., **Possibility of long range precipitation forecasting for the Hawaiian Islands.** *U. S. Weather Bureau, Research Papers,* No. 28, **1948.** 52 p. 9 figs., 29 plates, 9 tables. **DWB**—An island rainfall index $R = aD^2$ where D is number of rainy days per month, and indexes of rainfall frequency and intensity are studied statistically. Composite charts of pressure and pressure anomaly were prepared for different monthly indexes, showing that relation between rainfall and circulation anomalies can be indicated and that there is a lag sufficient to enable rainfall forecasts to be given one month ahead. *Subject Headings:* **Long range forecasting, Pressure anomalies, Hawaiian Islands.**

2B–210 551.509.33:551.515

Vitel's, L. A., [Method of use of analogues in long-period weather forecasting.] *Meteorologiia i Gidrologiia,* No. 3:22–32, **1948.** table. **GB-MO**—Defines coefficients of degree of relation of weather types in the same season in two different years: a cyclonic coefficient given by ratio of difference in number of days with depressions over a given region to maximum difference between any two years, and a corresponding anticyclonic coefficient. Table for winter seasons 1900–1946. *Subject Headings:* **Long range forecasting, Analogues, U.S.S.R.**

2B–211 551.509.33

Yazawa, D., **A result of seasonal forecasting based on statistical methods.** *Meteorological Society of Japan, Journal,* 26, Special report:58–62, July **1948.** In Japanese, English summary p. (12). 4 figs. **MH-BH**—A satisfactory forecast of regional rainfall in Japan in July 1946 was made by methods of correlation. *Subject Headings:* **Long range forecasting, Correlations, Japan.**

1949

2B–212 551.509.33:551.590.21:523.74

Baur, Franz, **Zurückführung des Grosswetters auf solare Erscheinungen.** [Tracing back general weather to solar phenomena.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A,* 1:(3–4)358–374, **1949,** 2(2–3):342–344, 1950. German, English and French summaries, p. 358–359. 3 figs., 2 tables, 19 refs. **MH-BH**—Double cycle in sunspot period. At spot max. and min. planetary circulation is weakened, monsoonal strengthened, subtropical high pressure belts weakened, contrast between winter and summer pressure in Asian continent increased. About 1½–2½ years before spot extremes planetary circulation is increased, sub-tropical high pressure belts are strengthened and shifted towards poles, difference between winter and summer pressure on continents decreased, tendency to severe winters less. Difference between area of faculae and area of sunspots shows the same double variation; hot faculae rich in UV rays predominate especially 2–3 years before spot extremes, whereas at spot max. and partly at spot min., spots are increased in comparison with faculae. The ultra-short electrical waves from the sun are supposed to be the cause of the simple variation in the tropics. (*See item* 4–33, *Meteorological Abstracts and Bibliography,* 1(4), April 1950.) *Subject Headings:* **Long range forecasting, Atmospheric circulation, Solar relations.**

2B–213 551.509.33:551.577.38

Bova, N. V., **O predskazanii zasukh v Povolzh'e.** [Forecasting of droughts in the lower Volga region.] *Akademiia Nauk, SSSR, Ser. Geogr. i Geofiz.,* 3(3):212–219, **1949.** 7 tables,

3 refs., equations. **DLC**—A statistical study of the relation between droughts in the lower Volga region and March sunshine, autumn and winter humidity, time of arrival of spring and rise of temperature from winter to spring. *Subject Headings:* **Long range forecasting, Drought, Volga region, U.S.S.R.**

2B–214 551.509.33:551.577.2

de Boer, H. J. and Euwe, W., **Forecasting rainfall in the period July–August–September for parts of Celebes and South Borneo.** *Indonesia*, (*K.*) *Magnetisch en Meteorologisch Observatorium te Batavia, Verhandelingen*, No. 36, **1949.** 14 p. 6 tables. **MH-BH**—Regression equations are developed giving rainfall of 3-month period using mean pressure for various preceding months at Kupang, Manila, Mauritius, Honolulu, Apia and Santiago and mean temperature at Hong Kong by a method of successive approximation. Multiple correlation: Celebes .82 to .83, Borneo .87. Effects considered to be transported by ocean currents. *Subject Headings:* **Long range forecasting, Correlations, Indonesia.**

2B–215 551.509.33

Neis, B., **Die synoptische Methode der Langfristprognose der Schule B. P. Multanowsky. (Teil I).** [The synoptic method of long range forecasting of the B. P. Multanovskiĭ school. (Pt. I).] *Zeitschrift für Meteorologie*, 3(10):304–309, Oct. **1949.** 3 charts, equations. **Pt. II.** *Ibid.*, 3(11–12):329–335, Nov.–Dec. 1949. 2 charts, 2 refs. **MH-BH**—For complete abstract *see item* 10–40, *Meteorological Abstracts and Bibliography*, 1(10), Oct. 1950. *Subject Headings:* **Long range forecasting, B. P. Multanovskiĭ.**

2B–216 551.509.33:551.543:551.577

Petitjean, L., **Prévision à longue échéance des anomalies de la pression barométrique et de la pluviométrie.** [Long range forecasting of anomalies of barometric pressure and rainfall.] *La Météorologie*, 4th Ser., No. 15:123–131, July–Sept. **1949.** 3 figs., fold. plate, ref. French and English summaries p. 123. **MH-BH**—By "differential" synoptic analysis of charts of monthly mean pressure 20–70°N, 100°W–60°E, author finds a double network of quasi-stationary pressure oscillations. This leads to the laws of propagation of alternate wave trains and the movements of centers of pressure anomalies, and to forecasting anomalies of pressure and precipitation for periods of the order of 6 months ahead. Shorter intervals than a month can be used to give greater detail. (*See item* 9–43, *Meteorological Abstracts and Bibliography*, 1(9), Sept. 1950.) *Subject Headings:* **Long range forecasting, Pressure anomalies.**

2B–217 551.509.33:523.72

Smagorinsky, M. and Brier, G. W., **Verification of temperature predictions based on an alleged periodicity in solar radiation.** *American Meteorological Society, Bulletin*, 30:256–257, Sept. **1949.** 2 tables. **MH-BH**—C. G. Abbot's forecasts of Washington temperature 1949 (*Smithsonian Miscellaneous Collections*, 111(6)) were examined statistically by correlation and not confirmed. Authors doubt reality of 6–7 day cycle. *Subject Headings:* **Long range forecasting, Forecast verification, Solar constant.**

2B–218 551.509.33:551.577.33

Takahashi, K., **On the possibility of seasonal forecasting based on periodogram analysis.** *Meteorological Society of Japan, Journal, 2nd Ser.* 27(12):370–372, Dec. **1949.** 4 figs. In Japanese, English summary p. 31. **MH-BH**—Finds periodicities of 4.4, 7 and 9 years in annual precipitation at Tokyo and discusses possibility of seasonal forecasting by extrapolation. Also deals briefly with temperature. *Subject Headings:* **Long range forecasting, Periodicities, Japan.**

1950

2B–219 551.509.33:551.513.7

Banerji, S. K., **Methods of foreshadowing monsoon and winter rainfall in India.** *Indian Journal of Meteorology and Geophysics*, 1(1):4–16, Jan. **1950.** fig., tables. **MH-BH**—A history of seasonal forecasting in India by correlation. Useful forecasts are only practicable by this method when the calculated departure of rainfall shows large differences from normal. The standard of accuracy aimed at is correctness 4 times in 5 and this often leads to wide limits, e. g., "Rainfall (and snowfall) is not likely to be less than 90% of average." Forecasts for northeast India were given up because they were no better than those given by statistics for past years. (*Same item* abstracted, No. 5–26, *Meteorological Abstracts*, May 1950). *Subject Headings:* **Long range forecasting, Correlations, History, India.**

2B–220 551.515.7

Lehmann, Martin, **Die Hochdrucklagen als Singularitäten im Witterungsablauf von Mitteldeutschland.** [Anticyclonic situations as singularities in the weather sequence of central Germany.] *Zeitschrift für Meteorologie*, 4(1–2):21–31, Jan.–Feb. **1950.** 8 figs., tables, 13 refs. **MH-BH**—For abstract *see item* 9–67, *Meteorological Abstracts and Bibliography*, 1(9), Sept. 1950. *Subject Headings:* **Long range forecasting, Anticyclones, Germany.**

2B–221 551.509.33

§Nakada, Y., **Long range forecasting by periodicity extrapolation method. (Preliminary report).** *Geophysical Magazine, Tokyo*, 22(2):99–108, Nov. **1950.** 5 figs., 3 tables, 9 equations. In English. **MH-BH**—The methods used since 1944 for forecasting 10 days, one, three and six months in advance, for 16 forecast districts in Japan are briefly described and illustrated. Prognostic charts are constructed, and a "periodicity extrapolation" technique based on deviations of monthly mean pressure developed and explained. *Subject Headings:* **Long range forecasting, Japan.**—*M. R.*

2B–222 551.509.33:551.577.38

Sampaio Ferraz, J. de, **Iminência de uma "Grande" sêca nordestini.** [Imminence of a great drought in northeast (Brazil).] *Revista Brasileira de Geografia*, 12(1):2–15, Jan.–March **1950.** fig., table. French, Italian, German, Spanish, Esperanto and English summaries p. 12–15. **DWB**—Extrapolation of curves compiled from sunspot cycle and rainfall data gave a forecast for 1939–1949 which the author claims was surprisingly accurate. Further extrapolation would lead to a forecast of a drought in the NE part of Brazil at the time of the minimum solar activity in 1956 and 1957. *Subject Headings:* **Long range forecasting, Sunspots, Drought, Brazil.**—*M.R.*

2B–223 551.583.14:523.74.(52)

*Yamamoto, T., **On the secular change of the climate in Japan (II).** *Geophysical Magazine, Tokyo*, 22(1):35–70, Oct. **1950.** 21 figs., 25 tables, 18 refs. In English. **MH-BH**—For Nagano it is expected that winter temperature will be *higher*, summer temperature *lower* than usual; summer precipitation *greater* and summer pressure *lower* than usual. The July temperatures at Miyako, Japan show a good correlation with the zonal index as determined from pressure differences between Hatidyozima and Nikol'sk (USSR). Secular changes in summer precipitation and temperature for various parts of Japan are studied in connection with changes in zonal index intensity of Pacific anticyclone, sun-spottedness, etc. Mechanism through which changes are effected is discussed. Attempts made at "Climatic forecasting" (1949–53). (For Pt. I *see item* 11–140, *Meteorological Abstracts and Bibliography*, 1(11), Nov. 1950.) *Subject Headings:* **Climatic changes, Sunspots, Long range forecasting, Japan.**—*M. R.*

SUPPLEMENTARY MATERIAL

2B–224 551.513

Namias, Jerome and Clapp, Philip F., **Confluence theory of the high tropospheric jet stream.** *Journal of Meteorology*, 6(5):330–336, Oct. **1949.** 9 figs., 9 refs. **DWB**—An attempt to explain the "jet stream" by a theory that the energy is derived from a direct transformation of potential into kinetic energy and is independent of stability, and that the confluence or juxtaposition of cold and warm air currents creates the concentration of isotherms and the potential energy field which results. The work of Palmén and others is drawn upon to support this theory; cross sections and normal charts of the Northern Hemisphere circulation illustrate this brief but detailed article. (*Same item* as No. 2–78, February 1950 *Meteorological Abstracts.*) *Subject Headings:* **Long range forecasting, Atmospheric circulation, Confluence.**—*M.R.*

2B–225 551.513

Namias, Jerome, **The index cycle and its role in the general circulation.** *Journal of Meteorology*, 7(2):130–139, April **1950.** 8 figs., 4 tables, 10 refs. **DWB, MH-BH**—Discussion of problem of stability of high or low zonal-index in winter, in the light of aerological data accumulated during the past decade. Obviously, since the zonal index is a derived and not a primary parameter, it cannot be forecast until the more elementary conditions (accumulation of cold air in the Arctic, confluence, etc.) are understood. This paper attempts to show, by means of 5-day mean 700 mb. and other charts and data, how such a mechanism might arise as would account for month to month and year to year variations in zonal flow. (*Same item* as No. 7–41, July 1950 *Meteorological Abstracts.*) *Subject Headings:* **Long range forecasting, Zonal index.**—*M.R.*

PART III. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Note: The contents of periodicals included in this section, are for information only, and will not be listed in either the author or subject indexes. When material is furnished in advance of date of publication, the pagination may be omitted.

Akademiia Nauk, SSSR, Izvestiia, Ser. Geograficheskaia i Geofizicheskaia, Volume 14, No. 1, January–February 1950.

Shuleĭkin, V. V.: **Fizika moria v krugu nauk Stalinskoĭ epokhi,** [Physics of the sea as a part of the science of the Stalin Epoch], p. 7–24.

Fedorov, E. K.: **"Slovo o iavleniiakh vozdushnykh ot elektricheskoĭ sily proiskhodiashchikh" Lomonosova i sovremennoe predstavlenie ob atmosfernom elektrichestve,** ["A word about the atmospheric phenomenas originated by the electrical force" by Lomonosov, and the present idea of the atmospheric electricity], p. 25–36.

Kropotkin, P. N.: **Kosmogonicheskaia teoriia O. IU. Shmidta i stroenie Zemli,** [The cosmogonical theory of O. IU. Shmidt and the earth's construction], p. 37–63.

Shifrin, K. S.: **Koeffitsient rasseianiia sveta na bol'shikh chastitsakh,** [The coefficient of scattering of the light by large particles], p. 64–69.

Berliand, O. S.: **Utochnennaia teoriia sutochnogo khoda temperatury vozdukha s uchetom izmeneniia koeffitsienta turbulentnoĭ teploprovodnosti v techenie sutok,** [An exact theory of the diurnal variation in air temperature, considering the diurnal variation in the coefficient of turbulent diffusion of heat], p. 70–81.

Kunits, A. V.: **O vliianii advektsii v svobodnoĭ atmosfere na temperaturnuiu stratifikatsiiu vozdushnykh mass,** [The influence of advection in the free atmosphere on the temperature stratification of air masses], p. 82–88.

Akademiia Nauk, SSSR, Izvestiia, Ser. Geograficheskaia i Geofizicheskaia, Volume 14, Number 2, March–April 1950.

Kolmogorov, A. N.: **K voprosu ob opredelenii koeffitsienta temperaturoprovodnosti pochvy,** [The determination of the coefficient of heat conductivity in the soil], p. 97–98.

Shifrin, K. S.: **Rasseianie sveta na krupnykh kapliakh vody i poliarizatsiia sveta v radugakh,** [The scattering of light on large-sized drops of water and polarization of light in the rainbow], p. 128–163.

Tverskaia, N. P.: **Vliianie potoka vozdukha na skorost' isparenііa kapel' vody,** [Influence of the air stream on the speed of evaporation of water drops], p. 164–170.

Brodovitskiĭ, K. V.: **Metodika ob'ektivnoĭ otsenki uspeshnosteĭ predskazaniĭ po universal'noĭ shkale,** [A universal scale for the objective checking of the accuracy of forecasts], p. 171–180.

Akademiia Nauk, SSSR, Izvestiia, Ser. Geograficheskaia i Geofizicheskaia, Volume 14, Number 3, May–June 1950.

Monin, A. S.: **Dinamicheskaia turbulentnost' v atmosfere,** [Dynamical turbulence in the atmosphere], p. 232–254.

Berliand, O. S.: **Raspredelenie atmosfernogo davleniia na poverkhnosti Zemli v sluchae statsionarnoĭ zonal'noĭ tsirkuliatsii atmosfery,** [Distribution of the atmospheric pressure on the earth's surface during stationary zonal circulation of atmosphere], p. 255–259.

Lopukhin, E. A.: **K voprosu o radiatsionnom rezhime khlopchatnika,** [On the problem of the radiational regime of cotton plants], p. 260–266.

Akademiia Nauk, SSSR, Izvestiia, Ser. Geograficheskaia i Geofizicheskaia, Volume 14, Number 4, July–August 1950.

Rodionov, S. F.: **Prozrachnost' atmosfery v ultrafioletovoĭ oblasti spectra,** [Transparency of the atmosphere in the ultra-violet part of the spectrum], p. 334–358.

Feĭgel'son, E. M.: **Raspredelenie temperatury zemnoĭ atmosfery po vysote pri nalichii luchistogo i vertikal'nogo turbulentnogo teploobmena,** [Vertical temperature distribution of the earth's atmosphere in conditions of radiant and vertical turbulent heat exchange], p. 359–382.

Akademiia Nauk, SSSR, Izvestiia, Ser. Geograficheskaia i Geofizicheskaia, Volume 14, Number 5, September–October 1950.

Semënov, V. G.: **Nekotorye prakticheskie vyvody iz teorii termobaricheskikh seish,** [Some practical conclusions of the theory of thermo-baric seiches], p. 440–447.

Khil'mi, G. F.: **O zaderzhanii lesami dozhdevykh osadkov,** [Retention of rain by forests], p. 448–453.

American Geophysical Union, Transactions, Volume 32, Number 1, February 1951.

Langwell, Patricia A.: **Forced convection cell circulation in clear air,** p. 7–14.

Gerhardt, John R.: **Temperature and moisture soundings over the Gulf of Mexico for March, 1949,** p. 15–25.

Gerson, N. C.: **Continental sporadic E activity,** p. 26–30.

Emery, K. O. and Gale, J. F.: **Swash and swash mark,** p. 31–36.

Isaacs, John D., Williams, E. Allan and Eckart, Carl: **Total reflection of surface waves by deep water,** p. 37–40.

Poppendiek, Heinz F. and Tribus, Myron: **A comparison of several heat and mass transfer networks of interest in water conservation,** p. 49–56.

Schiff, Leonard: **Surface detention, rate of runoff, land use, and erosion relationships on small watersheds,** p. 57–65.

Nizery, A.: **Electrothermic rig for the boring of glaciers,** p. 66–72.

Lieberman, J. A. and Hoover, M. D.: **Stream-flow frequency changes on Coweeta Experimental Watersheds,** p. 73–76.

Pickard, G. L. and Cameron, W. M.: **The Institute of Oceanography, University of British Columbia,** p. 112–113.

Discussion

Court, Arnold, Lambert, W. D., Darling, F. W. and St. Amand, Pierre: **"Atmospheric refraction at College, Alaska, during the winter, 1947–1948" by Pierre St. Amand and Harold Cronin.**

American Meteorological Society, Bulletin, Volume 31, Number 10, December 1950.

Crawford, E. Marion: **A synoptic study of instability lines,** p. 351–357.

Spilhaus, Athelstan F.: **Progress in meteorological instrumentation, 1920–1950,** p. 358–364.

Fletcher, Robert D. and Manos, Nicholas E.: **The importance of several meteorological elements in the spreading of smoke,** p. 365–370.

Colson, DeVer: **An unusual radiosonde flight at Lander, Wyoming, indicating large vertical motions,** p. 371–374.

El-Fandy, M. G.: **Effects of topography and other factors on the movement of lows in the Middle East and Sudan,** p. 375–381.

Shaw, R. H. and Waggoner, Paul E.: **An evaluation of dew point fluctuations in the microclimatic layer,** p. 382–384.

Todd, David K.: **Diurnal variation of precipitation frequency at New York City,** p. 385.

Langmuir, Irving: **A seven-day periodicity in weather in United States during April, 1950,** p. 386–387.

American Meteorological Society, Bulletin, Volume 32, Number 1, January 1951.

Fawbush, E. J., Miller, R. C. and Starrett, L. G.: **An empirical method of forecasting tornado development,** p. 1.

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